

THE POLAR TIMES



Robert Falcon Scott



Roald Amundsen



The Polar Times

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Polar Society Names Brainard Its First Honorary Member

Polar Explorer Is Honored in Ceremony on 80th Birthday.

WASHINGTON. December 22

Surrounded by friends and relatives of the men, now dead, with whom he pioneered in the Arctic half a century ago, Brig. Gen. David L. Brainard, U. S. A., retired, celebrated his 80th birthday yesterday by receiving the first honorary membership granted by the American Polar Society.

At a colorful ceremony in the Army and Navy Club, Gen. Brainard, last survivor of Gen. A. W. Greely's Arctic expedition of 1881-4, received an honorary membership scroll from Mrs. Marie Ahnighito Peary Stafford, known as "The Snow Baby" because she is said to have been born further north than any other white child in the world.

As he read congratulatory messages from outstanding American and world officials, explorers and geographical societies, Gen. Brainard, sturdy, erect and clear-eyed despite his 80 years, 42 of them spent in the Army, recalled far different birthdays he had spent.

Most notable of them was that of 1883, spent in a rude hut of heavy granite stones dug from the snow and ice and laid in place with swollen, bleeding hands, while members of the Greely expedition awaited the relief ships that never came. His birthday "banquet" on that day was of rancid seal meat and rank Arctic fox, with rock-like, mouldy hard-tack. That birthday marked the beginning of a terrible Winter. On June 22 of the next year, when the U. S. S. *Thetis*, with Commander W. S. Schley in charge, reached Cape Sabine, only seven of the 25 men in the party were alive. Six of the seven lived to reach civilization.

Airplane Ends Exploration Afoot.

In presenting the scroll, Mrs. Stafford, daughter of the late rear Admiral Robert E. Peary, who discovered the North Pole in 1909, pointed out that the airplane has brought to a close the days of Arctic exploration on foot.

"You are the last of that hardy group of men who really pioneered the Arctic," she told Gen. Brainard. "Your accomplishment was tremendous. It really began the conquest of the polar regions and enabled this country to take a leadership in the pioneering of those icy wastes which it never was to lose."

Mrs. Stafford is a member of the American Polar Society.

Among the scores of congratulatory letters, cables and telegrams received by Gen. Brainard was one from Secretary of War Woodring, who said, in part:

"Today marks the 80th milepost in your journey of life—a journey replete with accomplishments in the realms of science, leadership and remarkable fortitude which are recog-

nized and admired throughout the world, and, I am certain, serve to inspire the youth of many lands.

Army Service Praised.

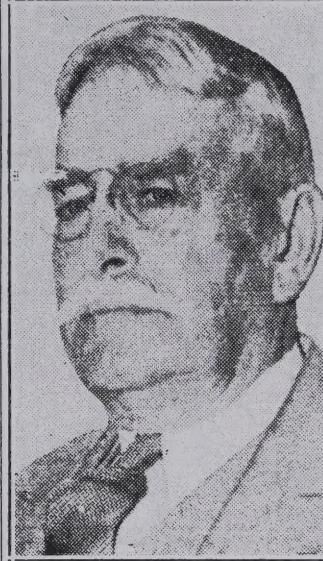
"Your meritorious services in the United States Army, covering a span of 42 eventful years, during which you ascended the ranks from private to general officer, and your distinguished and heroic work with Gen. Greely's Arctic Expedition arouse the pride of every member of the Army."

The scroll was signed by Paul Siple, president of the society and a veteran of Admiral Richard E. Byrd's two Antarctic expeditions. Inscribed on the scroll is a map showing the route taken by Gen. Brainard then a sergeant, and Lieut. James B. Lockwood to the highest point north ever reached on Greenland's northern coast up to that time. This surpassed a record which had been held by British explorers for 275 years.

Mrs. Stafford made four trips into the Arctic before she was 10 years old. During the Summer of 1932, accompanied by her two sons, she headed the Peary Memorial Expedition to Greenland to erect a 60-foot stone monument in memory of her father.

Gen. Brainard, who now lives quietly in Washington, still carries on his face the scars of wounds received in a battle with the Sioux Indians on May 7, 1877, at Little Muddy Creek, Mont.

One of the general's cherished possessions is a gold watch given him 50



General David L. Brainard

years ago by the Royal Geographic Society of London in tribute to his Arctic work. He also holds the Explorer's Medal of the Explorers' Club of New York and the Purple Heart, awarded him in 1933.

A floral tribute from the president and board of trustees of the National Geographic Society was among those received by Gen. Brainard yesterday. Messages were received from the Explorers' Club of New York, the Royal Geographic Society of London, the Scott Polar Research Institute of Eng-

land; Matthew A. Henson of New York, colored aide who accompanied Peary to the North Pole; George H. Carr of Prince Albert, Saskatchewan, a member of Peary's 1893 expedition; the Geographic Society of Chicago; Dr. J. M. Mills of New York, surgeon who accompanied the first Peary relief expedition, and F. W. Stokes of New York, who was a member of expeditions to both the Arctic and the Antarctic.

Among the guests at the "birthday party" were Col. Jeremy Taylor, Col. Julian Cabell, Mrs. Edward Breck, Gen. and Mrs. Henry G. Sharp, Miss Antoinette Greely, Admiral and Mrs. Hilary P. Jones; August Horowitz, secretary of the Polar Society and editor of its publication, the *Polar Times*; Gen. and Mrs. Peyton March, Mrs. Calvin Neff, Mr. and Mrs. A. W. Greely, Jr.; Col. and Mrs. John Greely; Miss Rose Greely, Mr. and Mrs. Donald Cooper, Russell J. Walrath, Miss Margaret McGrain, Maj. Clayton Emig and Col. John A. Lockwood, a cousin of Lieut. Lockwood.

Gen. Brainard has the distinction of being one of the few living retired generals to have risen from the humble rank of "buck private."

Born in Norway, N. Y., he enlisted in the 2d U. S. Cavalry when he was 19.

During the Winter of 1883-4, when Greely's men suffered their greatest privations, Brainard was in charge of rations. He is credited with prolonging the existence of the party by 70 days by catching shrimps and sea lice and distributing them to the survivors, all of whom later stated their belief that he never took his own rightful share from their scanty store.



Mrs. Marie Ahnighito Peary Stafford, daughter of the late Admiral Robert E. Peary, North Pole discoverer, is shown presenting the American Polar Society's scroll to Brig. Gen. David L. Brainard, U. S. A., retired, the last surviving member of Gen. A. W. Greely's Arctic expedition. At right is Russell J. Walrath, vice president of the polar group.

Aged Survivor Of Greely Trip Recalls Perils

WASHINGTON, Dec. 20

To see Brig. Gen. David Brainard, with his ferocious eyebrows, his picturesque white moustache, his crimson cheeks, one would never suspect him of having done anything more strenuous than sit in a leather armchair at the Union League Club all his life hating the proletariat.

But the general has had much better things to do than sit in an armchair, as will be fulsomely testified tomorrow, on his eightieth birthday, a birthday, incidentally, considerably different in its circumstances from one he unsatisfactorily celebrated 45 years ago in the Arctic by eating some rawhide sealskin shoestrings.

Gen. Brainard is the Nation's oldest living polar explorer. He penetrated the awesome wastes of the Northern snowfields in 1881, when feet were the sole means of locomotion. The airplanes which whizzed Byrd and Ellsworth into the depths of the Antarctic were as yet unborn dreams.

At the time he was a young cavalry sergeant just signed up with the Signal Corps of the Army. He had been sent into the Arctic with the tragic Greely expedition, from which only six of 25 young soldiers returned alive. The rest froze to death or died of starvation, one of the most ghastly tales in exploring annals.

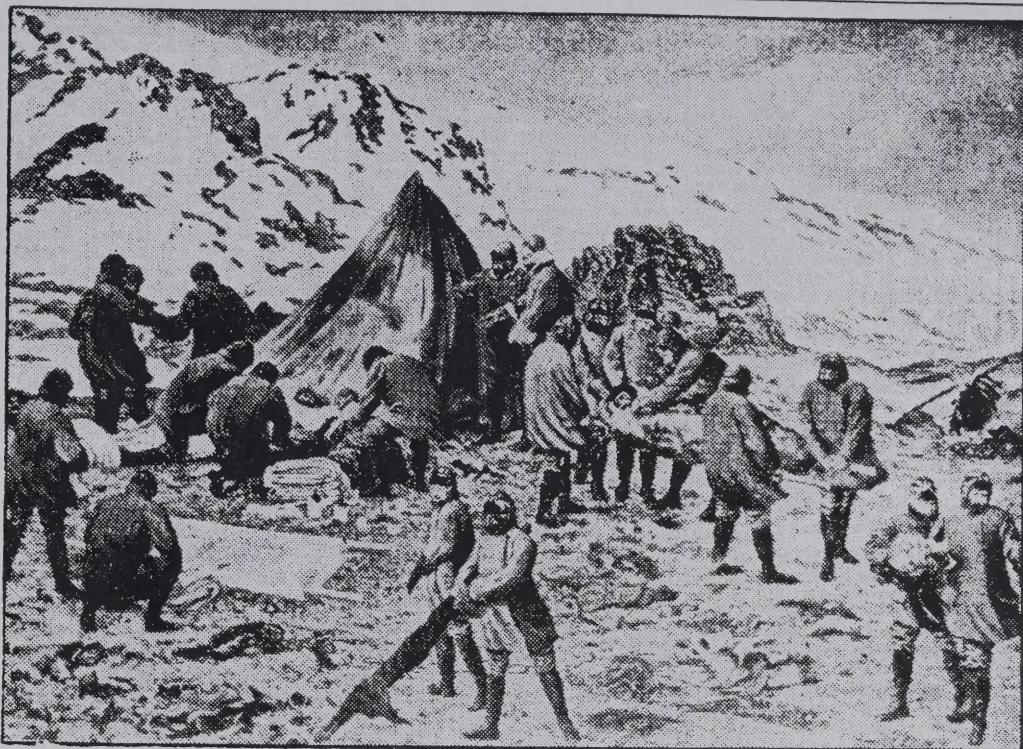
Tomorrow the old gentleman's birthday will be suitably commemorated by presentation of a scroll upon which is a map showing the course of his trek to what was then the northermost point ever attained by white man. Midst the plushy comforts of the fashionable Hay-Adams House here, where he lives a quiet life, the general yesterday closed the miles between here and starvation in upper Greenland, in vivid recollection.

It was so cold on the first of his three birthdays in the Arctic that rum froze in the keg and kerosene had to be thawed out before lamps could be lighted. On the first birthday, though, things weren't so bad—they staged a gay little party in their collapsible house and quaffed toasts to the turning of the solstice, for after that day the interminable darkness of the arctic nights began to wane toward summer, and the active work of advancing to their goal could soon be commenced.

It was just as cold the next birthday. The spirits of the men were down. Supplies had failed to reach them from a relief ship, and although they had taken enough with them for two years, nevertheless the knowledge that one supply ship had failed did not reassure them as to success of later ones. The Christmas presents they had opened the previous year, (packed aboard ship in July) were not to be thought of this year, but that was a minor matter, so long as the food held out.

The Third Was Worst.

It was still as cold on the third birthday, but this time there was no party, no toast to the arrival of the solstice, and no concern about



Christmas presents. All that filled the half-crazed minds of the men was hunger, and fear that they were to die on the pitiless snows of the great dark-enshrouded northland, 250 miles from the last Eskimo igloo, thousands of miles from the American homes whence they had come, cut off, abandoned and helpless, a second relief ship having been crushed between icebergs and sunk. They knew no other relief ship could reach them next summer because then they would be dead.

But to go back to the beginning, with Gen. Brainard telling the tale: "The expedition was organized in 1880 and was commanded by Lieut. A. W. Greely. Its purpose was to make scientific observations within the Arctic Circle. At the same time 14 expeditions from half a dozen European nations were to do the same thing at various points in the Arctic. The Army was assigned the job for the United States.

"We went North in July, of '81, making our final start from Newfoundland. We reached the place selected for our winter quarters in Lady Franklin Bay about the middle of August and immediately set up our house, which had been constructed in sections, an innovation for those times. It was about 60 feet long by 22 wide.

"It had double walls, doors, and windows, and was lined inside and out with tar paper and provided a very comfortable habitation for the winter. There was plenty of coal, but the temperature was held to about 60 degrees inside in order to prevent shock when we ventured out of doors. We named the house 'Fort Conger' in honor of Senator Conger, of Michigan, who was largely responsible for getting the bill through Congress authorizing the expedition."

The first holiday season in the Arctic began with triple-barrelled celebration on December 21. It marked Sergt. Brainard's twenty-fifth birthday, the turning point of the six-month night, and the advent of Christmas. Brainard was already popular with the outfit. Lieut. Greely issued him an extra quart



Upper: Albert Operti's detailed painting of the dramatic rescue of the survivors of the Lady Franklin Bay expedition, 1881-84, by the United States Navy on June 22, 1884, shows Gen. D. L. Brainard, U. S. A., lying against tent in upper left of picture; H. Biederbick, U. S. A., beside Gen. Brainard; Gen. A. W. Greely, U. S. A., in midst of rescue group in center, and W. S. Schley, commander of the rescue party, (1) standing just to the right of the tent. Lower: the six survivors of the Greely expedition, shown shortly after their rescue at Camp Clay, Cape Sabine. Gen. Brainard and Gen. Greely are seated. Gen. Brainard is at the left.

of rum and he shared it with his fellows and the Eskimos, all of whom drank his health.

Christmas Eve Lieut. Greely inspected the barracks and found the men excitedly awaiting the arrival of Christmas. The walls were bright with flags and every lamp was lit, presenting, as Greely recorded, "a gay and lively appearance not unlike Army quarters in the Far West on such occasions." Presents were laid out on the dining table, the stoves roared with fuel from a nearby coal outcropping the men had found, and all was snug and jolly.

Next day Christmas presents brought from home were unwrapped, one of the officers dressed up as Santa Claus, the room resounded with salutes and cheers to the after-dinner speeches—especially when a homeless soldier who had expected nothing was happily remembered with gifts from his comrades. A prolonged howl of laughter greeted one soldier when he unwrapped a package and found—a fan. Egg-nog was passed freely, and the party ended with the singing of songs of home and musical numbers by a violinist and a mandolin player in the company.

Gen. Brainard's story continues:

"Our party kept active throughout the winter, establishing provision depots along the coast for the spring exploration, constructing sledges, and preparing our field equipment. Our vessel, the *Proteus*, had been sent back to St. Johns, so we had no means of leaving the Arctic regions except on sledges or small boats, which were entirely out of the question.

Had Special Ration.

"We had a special ration for sledging purposes consisting of some kind of meat, usually pemmican (buffalo meat dried), mixed with a portion of tallow or other fat and some raisins together with a little sugar. This made a concentrated food which was practical and palatable for the open country. Our rations also included hardtack and tea or chocolate. Coffee was seldom used.

"In the spring of '82 our camp was established on Grinnell Land. We crossed from Grinnell Land to Greenland in that spring and explored about 100 miles of the coast of Greenland, considerably to the north of the highest point ever before reached.

"Lieut. Lockwood and myself were detailed to this particular excursion. An Eskimo dog-driver, Fred, went with us. He was one of two Eskimos who for some reason were willing to accompany us into a cold region where no Eskimo had ever dared venture before. The point we reached was a little less than 400 miles south of the North Pole, which broke the record which English explorers had held for nearly three centuries. The British had sent several expeditions northward, each one surpassing the other, but we attained many miles further than they had succeeded in doing.

"I have been asked about my sensations when we reached that point farther north than any man had before gone. Really, we were too cold, too hungry, too anxious about our chances of getting back, to feel any thrills. Our rations were about exhausted. We had come to the time when we had to eat dog meat, but we avoided that temporarily by killing one of the dogs and feeding it to the other dogs, and then eating the dog rations. It was a most disagreeable dish—a coarse pemmican and very mouldy—but better than dog meat.

"Upon our return we joined with the others in laying out more depots through the summer and hunting musk oxen to furnish new meat supplies for the winter. Altogether we killed 103 musk oxen and in addition a great number of wild geese and various other birds."

When winter came again, and with it December 21, the day was again celebrated by the issuance of an extra quart of rum to Sergt. Brainard, and in accordance with previous custom, he split it with his comrades and with the two Eskimos. As one of the men observed in his diary: "The day was observed in the usual manner but hardly with as great success as the previous year."

"On January 18 the first man died of starvation. From that time on the deaths were frequent.

"During that winter we were eating sealskin clothing, sealskin boots, and the sealskin covering of our sleeping bags. We caught sea lice, tiny crustaceans, of which it took 200 to make an ounce, and these we stewed with the sealskin. (Gen. Brainard invented a burlap net for seining the lice.) We also raked the ocean with barrel hoops for kelp and other seaweed which we used in our stews.

"If we had not killed some foxes during that winter and some water birds, and fortunately in April a polar bear and some seal, we never would have survived. The Eskimos were our hunters, but one of them was drowned fishing and the other died of starvation. From then on, nothing but death confronted us. We did not know how to hunt ani-

mals in the blackness of the Arctic night.

"One by one the men died, all of starvation except Charles B. Henry. He was executed for stealing some sealskin shoestrings which he ate raw, making him sick. His sickness betrayed his theft. After two or three warnings, Lieut. Greely ordered him shot. I was on the execution squad of three. We were selected because we were strongest.

"The plan was that a fourth man should load two of our guns with blank cartridges and the third with a ball. But our guns were all of different caliber so that meant the fourth man would know which was the executioner. None of us wanted to be known as the killer, so finally we decided that one of us would take a .45 and perform the execution and swear the others to secrecy. This was done. Henry was marched out into the cold and shot. The other two men are dead now, and they never told, and of course I never shall.

"During that endless winter we talked often of food, discussing imaginary menus, and often mentioning a restaurant in Washington famous for its steamed oysters. We would go over the menus countless times, ordering imaginary dinners of dozens of courses, never realizing that our half-crazed brains were conjuring food enough for 10 men apiece. Then we would turn to helping Ellison, whose hands had frozen and dropped off. We lashed hooks to the stumps of his arm. Others froze in the sleeping bags. Several men's feet dropped off."

Life in the hut settled down to a

feeble war against starvation, cold and insanity. The fires were all out, rekindled only to cook their miserable stews. The men remained in their sleeping bags all day and all night in pitch darkness. The drinking water turned salty. Two men attempted to reach a cache of food 250 miles south and were lost. (The War Department later refused to recognize the promotions because they were "irregular.") Some of the men toward the last were sleeping in bags with dead comrades, too weak to remove them.

On May 14 the last of the rations were portioned out. A week later men were dying at the rate of one or two a day. Sergt. Gardner died, exclaiming: "Mother! Wife!" Private Schneider penciled a dying note: "I apologize. I ate part of my pants without telling you. It was the only dishonest thing I ever did." A blizzard broke on June 20. Next day part of the tent blew away. No one had strength enough to crawl out and repair it. By then only six remained.

On June 22 Brainard crawled out to get drinking water. That midnight the dying men thought they heard three whistle blasts. Greely weakly asked Brainard, who was the strongest of the survivors, to try to look around. Brainard went outside and in 15 minutes came back to report "It was only the wind."

"Yes, the wind," murmured Greely, his voice trailing off as death closed its grip on his brave heart.

As he snut his gaunt eyes he heard a voice.

"Lieut. Greely?"

Rescue had come. It was Commander Winfield Schley of the Navy. His two ships were at anchor in the bay.

"Yes, I am here, dying . . ."

Only Brainard was strong enough to rise to his feet and come to a salute.

Resuming Brainard's story:

"The storm had been blowing three days. We had no food left. Connell was dying when the whistle blew. We knew the symptoms very well. Biederbeck managed to pour a teaspoon of cooking alcohol into his mouth. It revived Connell somewhat and undoubtedly saved his life.

"The relief party gave us some milk punch, but we had passed to the point where we no longer felt the pangs of hunger and so we felt no satisfaction in the food. I think if our rescuer had said, 'We are going away and leave you here,' we would merely have answered 'Please, go.' We wanted only sleep. Death held no more terrors for us."

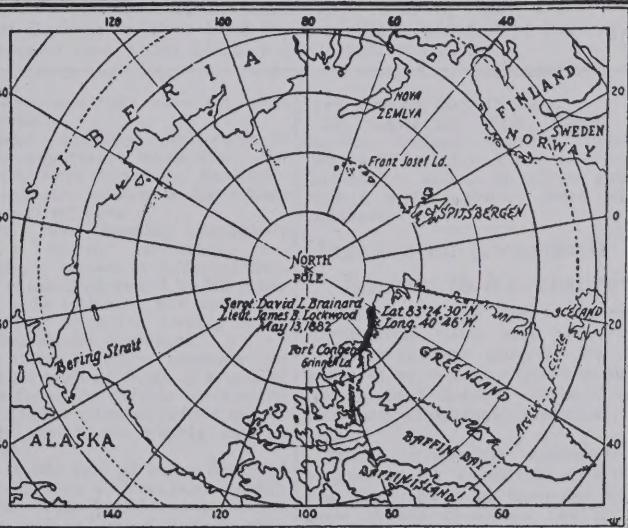
The survivors were slowly nursed back to health aboard the Navy ships. Brainard gained 22 pounds the first week, 20 the second, and 18 the third. He had lost 85 pounds from starvation.

EXHIBITS GREELY RELICS

WASHINGTON, Aug. 13.—Relics of one of America's most noted and tragic polar expeditions, the Greely Expedition of 1883, were put on exhibition today at the Smithsonian Institution.

Foremost among the objects in the collection is the prayerbook from which General Greely, then Lieutenant, conducted daily services during the winter spent at Lady Franklin Bay, Grinnell Land.

The flag which flew above the Lady Franklin Bay camp, a sprig of Arctic grass General Greely collected, and the spectacles and gloves he wore at the camp are other articles in the collection.



In recognition of his contribution
to Polar Exploration
The American Polar Society
has elected
General David L. Brainard
an Honorary Member

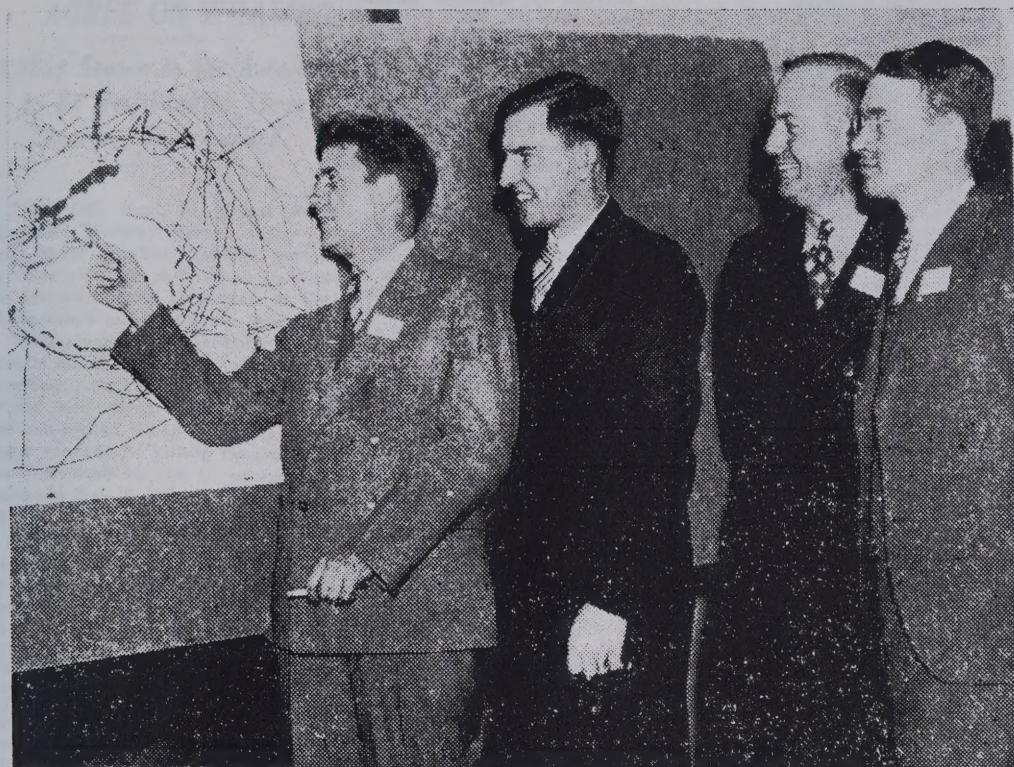
Paul A. Siple
President

December 21, 1936.

Times Wide World Photo.

GIFT FOR LAST GREELY EXPEDITION SURVIVOR

Byrd's Aides Have Reunion as Geographers Meet



These "Byrd-men" who shared the rigors of the Antarctic with Admiral Byrd were snapped yesterday looking at a map of Little America in an informal reunion at the Association of American Geographers conclave at the Onondaga. Left to right, are: Dr. Laurence M. (Larry) Gould of Carlton college; Paul Siple of Clark university; Dr. Thomas C. Poulter of Chicago and Alton Lindsey of Cornell university.

MAP ERRORS LAID TO POLAR MIRAGE

Hobbs of Michigan Explains Before Geographers Weird Arctic Phenomenon.

SYRACUSE, Jan. 1.—Stories of "polar mirages" which have thrown explorers' calculations askew for many years and led to mistaken "discoveries" of land enlivened sessions of the Association of American Geographers here today.

Headed by Professor William H. Hobbs of the University of Michigan, the association's president, distinguished explorer-scientist, told of seeing glaciers that were actually far under the horizon, of watching Eskimos hunting "in the air" 200 miles away and of spotting a lighted candle from a distance of nine nautical miles.

Recent recognition of the polar mirage, which is as deceiving as, although of different sort from, the desert mirage, marked an important step in polar research, Dr. Hobbs said in a paper on "An Optical Phenomenon and Its Relation to the Discovery of Polar Lands."

Early Errors Accounted For

For centuries explorers have been "discovering" land that wasn't there and mapping mountainous terrain that later explorers "sailed right through" and learned was 200 to 300 miles farther away than charted. Many early mistakes in map making are being corrected

now that scientists have hit upon the trouble.

Several explorers who suffered loss of reputation when their discoveries were found to be incorrect are now known to have been victims of mirages.

Light rays bending concavely from a "mirror" formed by contact of air masses at different densities cause objects 200 to 300 miles away to be reflected, and as clearly as if they were but twenty miles off, Dr. Hobbs explained.

The polar mirage presents an image as high as three quarters of a mile from the earth's surface, he said. Desert mirages reflect nearer objects which are visible at low altitude.

Dr. Hobbs told of being deceived by mirages on a Greenland expedition, when the party was on Mount Evans with a tested horizon visibility of only a dozen miles.

"On certain days," he said, "wholly new panoramas would unfold before our eyes, glaciers far below the horizon and far-distant landscapes would be clearly visible."

Saw Hunters 200 Miles Away

From Dr. Elmer W. Elkblaw of Clark University came a story of having watched Eskimos hunting on the shore of Greenland 200 miles from the point of observation.

Counting lighted candles spaced a mile apart for nine nautical miles along the Ross Sea ice barrier on an Antarctic Winter night was the experience of Dr. Thomas C. Poulter, senior scientist and second in command on the Second Byrd Antarctic Expedition.

The candles, Dr. Poulter related, were used as guiding beacons when he and two companions made their 123-mile trek from Little America to rescue Admiral Byrd at his soli-

tary base on Aug. 11, 1934.

Dr. Lawrence M. (Larry) Gould of Carlton College, Admiral Byrd's lieutenant on the First Antarctic Expedition, and O. M. Miller, geographer and explorer, were also speakers.

Unexplored Areas Still Beckon to Adventurers

Challenge of two large unexplored Arctic areas which still beckon to polar adventurers probably will be answered by men in airplane or submarine, Dr. William H. Hobbs of the University of Michigan predicted last night.

In his presidential address at a banquet of the Association of American Geographers in three-day conclave at the Onondaga, the noted geologist reviewed progress of discovery and exploration in the Arctic region since the pioneer polar observations of Pytheas in the fourth century before the Christian era.

Early sailing voyages, treks across icy wastes by dogteam and sledge and more recent airplane expeditions have given man fairly complete maps of far northern geography, he said, but two little known areas remain. They lie largely within the East Siberian sector and Alaskan sector of the Arctic and never have been explored even by reconnaissance, he pointed out. Even the smaller of the two areas is large enough to include the British Isles, he estimated.

Cloudy mists which envelop the uncharted areas for much of the warmer season make flying visibility poor and plane trips had best be taken in late winter or very early spring, according to Dr. Hobbs.

"Ideally suited for exploration

POLAR WEATHER UNITS PLANNED BY WILKINS

Explorer Says Fixed Stations Are Needed—Would Use Special Submarine for Task.

Sir Hubert Wilkins, explorer of the Arctic and Antarctic regions, outlined plans to establish weather observation stations in these areas in an address Dec. 8.

After telling of his experiences in the vicinity of the North and South Poles Sir Hubert said he planned to investigate aerial conditions there either next year or the year after.

He reviewed the conditions that have made it necessary to establish fixed observation posts for climatic and wind changes in order to prognosticate weather conditions affecting the whole world. He explained that it would be difficult to set up fixed posts in many of the Arctic localities due to their peculiar conditions and proposed that a submarine especially equipped for this purpose be employed. He emphasized his desire to carry on special investigations in meteorology rather than to reach either the North or the South Pole.

"Scientific investigation of these sources requires fixed spots," he declared. "Consequently a seagoing vessel of the submarine type would be needed, as a surface vessel cannot proceed beyond a point some 450 miles distant from the North Pole."

He said the special type of submarine he planned to use was "one which would slide along the bottom in a manner similar to that in which another vessel goes along the surface of the sea."

ESKIMOS TRICK WOLVES

Put Whalebone in Tallow Bait to Kill Marauders of Deer.

POINT BARROW, Alaska, Dec. 5 (AP).—An old Eskimo trick today helped natives turn back wolf packs which had repeatedly stampeded 8,000 reindeer being driven across 500 miles of Arctic wasteland to Barter Island.

Chunks of frozen tallow were dropped for the pursuing wolves to snap up. Inside each chunk the Eskimos had bent a six-inch piece of whalebone, sharpened to a needle point.

When the tallow melts the whalebone springs open, piercing the wolves' stomachs, and slow death is their fate.

Deer for the Barter Island drive were taken from the Point Barrow herd. Several hundred natives and a few whites were reported near starvation in the Barter Island area last summer.

Griswold Collins, a veteran game warden sent from Juneau to investigate and try to destroy the wolf packs, said he believed that the Eskimo method of killing wolves would prove effective.

within these areas" would be a submarine especially designed for polar navigation, he asserted, and he predicted that Peary's "Crocker land" which is thought to lie within the unexplored section will be discovered either from a plane or submarine.

BRITAIN AND NORWAY AGREE ON WHALING

Killing Season in the Antarctic to Be Restricted to Three Months—Boats Limited.

LONDON, Sept. 21.—Great Britain and Norway agreed today to end their whaling dispute, which a fortnight ago threatened to lead to indiscriminate slaughter of the Antarctic's most valuable denizens.

The agreement is based upon proposals made by the Norwegian Government after its seamen at Sande Fjord had lifted their boycott of British-owned whaling ships. The open season for killing whales will be restricted to the three months between Dec. 8, 1936, and March 7, 1937.

At the same time a limitation will be placed upon the number of small whale-catching boats that may be sent from a single whale-factory ship. The number will vary from seven to five, according to the classification agreed upon between the two governments.

In the case of British-owned ships this part of the agreement will be voluntary, as there is no legislation governing the government's power to restrict the number of whale catchers.

An official statement tonight said:

"It is hoped these arrangements will be completed early this week and that thus a somewhat stormy chapter in the history of modern whaling will be happily brought to a close."

END OF WHALING IN SIGHT

Increased Kill Offsets Improved
Oil Extraction, Expert Says.

CAMBRIDGE, Mass. (AP).—Professor Johan Hjort, director of the biological laboratories of the University of Oslo, who has devoted the last twenty years to building up Norway's modern whaling industry, admits that its permanency is a matter of doubt.

The toll taken by an ever-increasing annual kill, Professor Hjort told fellow-scientists at the Harvard Tercentenary Celebration, has not been offset by the increasing efficiency of oil extraction.

"Fifty per cent more oil is conserved from each whale nowadays by the use of more scientific methods," he said, "but that is not a solution and we have reason to fear the further growth of the whaling industry. How long the whaling industry will last and how long it can be made to last are problems we have not yet worked out."

Modern whaling ships, he declared, had increased the annual catch from 14,000 a few years ago to the recent rate of between 30,000 and 40,000 animals.

AUSTRALIA GETS BIG AREA

Act Assuming Control Over Ant-
arctic Region Is Ready.

CANBERRA, Australia, Aug. 22.—An act enabling Australia to assume control over Antarctic terri-

tory lying south of the Sixtieth Parallel between 160 degrees East Longitude and 45 East Longitude excepting Adelie Land will shortly be proclaimed.

The area is nearly as big as Australia. Most of it was explored by Sir Douglas Mawson's expedition in 1929-30 and 1930-31. It contains great whaling grounds and it is believed coal and fur-bearing animals can be exploited commercially.

A British Order in Council dated Feb. 7, 1933, assigned this area to Australia.

The Special Gazette proclaims the Whaling Act passed last year, implementing the League of Nations' international whaling convention. The act provides for policing Australian whaling ships and forbids the taking of undersized whales and females with calves. The Premiers' conference will discuss the passing of State legislation to control whaling in the Commonwealth.

ANTARCTIC TRIP REVIEWED

Members of Byrd Party Tell of Adventures—Dogs Are Shown.

NEW YORK, Dec. 3

Tales of high adventure in Little America were related yesterday afternoon by members of the second Antarctic expedition to 1,000 persons attending a polar show in the ski village of the John Wanamaker store. Jack, Rear Admiral Richard E. Byrd's lead dog in Little America, made his first appearance in New York City, together with a complete team of "huskies."

A demonstration of harnessing and unHarnessing the dogs and loading sledges was put on by Stewart Paine, who was master of the dogs in Antarctica. Recordings of the distinctive cries of seals and penguins and other wild life of Little America were presented and illustrated motion pictures shown.

A feature of the show was the exhibiting of fur clothing, trail equipment and other articles used by members of the expedition.



Paul Siple and his bride, the former Miss Ruth Johannesmeyer

PAUL A. SIPLE MARRIES

Member of Byrd Expeditions Weds
Miss Ruth Johannesmeyer.

MEADVILLE, Pa., Dec. 29 Paul A. Siple of Erie, member of the two Antarctic expeditions of Rear Admiral Richard E. Byrd, today married Miss Ruth Johannesmeyer of Meadville in Ford Memorial Chapel, Allegheny College, where both had

been students. The ceremony was performed by the Rev. E. M. Gearhart, Lutheran minister of Erie. The bride is a daughter of Mr. and Mrs. Charles G. Johannesmeyer of this place.

Alton Lindsey of Ithaca, N. Y., classmate of Mr. Siple, who accompanied him on the second expedition, was best man. Miss Ilsa Johannesmeyer, sister of the bride, was maid of honor.

After a wedding trip, they plan to live in Worcester, Mass., where he has been a postgraduate student at Clark University.

A HUGE FLOATING WHALE FACTORY



Times Wide World.

The Kosmos, a 22,000-Ton Ship With a Capacity of 180,000 Barrels of Oil, in Operation Near the Entrance of Ross Sea in the Antarctic. Several Whales Are About to Be Hauled Up to the Deck Through a Slipway in the Stern.

The Polar Times
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THE POLAR TIMES highly recommends "The Polar Record," published January and July by the Scott Polar Research Institute, Cambridge, England.

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are one dollar a year, which entitles members to receive THE POLAR TIMES twice a year.

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GROUP SHOWS EMPEROR PENGUINS COLLECTED BY ADMIRAL BYRD IN ANTARCTIC

Field Museum of Natural History

By RUDYERD BOULTON
Assistant Curator of Birds

With the recent installation of the emperor penguins in Hall 20, the first of twenty new bird habitat groups was placed permanently on exhibition. All of the most important ecological environments in which birds live are to be shown. This first, the polar ice shelf, will be closely followed by others, including: savanna, mountain rain forest and desert, of north, west and south Africa; lowland rain forest, savanna, and cloud forest of Central America; inundated forest and pampas of South America; moor of Scotland, and fern forest of New Zealand.

These penguins, very strange and exotic birds, are a gift from the Chicago Zoological Society, which received them from the Second Antarctic Expedition (1935) of Rear-Admiral Richard E. Byrd. The eight penguins shown in the group were mounted by Staff Taxidermist John W. Moyer, assisted by John LaBonte. A method unusual in bird taxidermy was employed. Manikins similar to those used for large mammals were modeled from the skeletons in accordance with measurements of fresh specimens. Staff Taxidermist Leon L. Walters cast and reproduced the bills and feet in cellulose-acetate, which gives most realistically the appearance and texture of life. Staff Artist Charles A. Corwin and Mr. Arthur G. Rueckert painted the panoramic background of the great Ross ice shelf.

Six of the penguins arrived alive at the Chicago Zoological Park in Brookfield, although afflicted with an incurable respiratory disease caused by a fungoid infection. Never before had these extraordinary birds

been transported alive to America. The opportunity afforded for study and observation of living specimens was thus unique.

Emperor penguins deserve the extravagant adjectives that are applied to them. They live farther south—nearer to the South Pole—than any other birds. They

is no material from which to build a nest, so the egg is held on the feet and a fold of abdominal skin lowered over it, enclosing it as in a warm muff. The emperors instinctively know that an unprotected egg would freeze solid in a very few minutes. Consequently every unoccupied bird in the

colony makes a rush for an egg when it is released by a hungry parent that is returning to sea after several days of fasting. Fierce squabbles take place over the eggs and even more roughly handled are the chicks—fluffy balls of black, gray and white down—when, after seven weeks incubation, they hatch in early September, just as the sun at last shows over the horizon. Community of interest is essential to these birds. Their success depends entirely on cooperation even if it is occasionally carried too far. Sometimes the poor little chicks crawl away to hide in the ice to escape the bickerings of their foster parents, an

escape that often ends in a frozen death.

The infant mortality is estimated at from 70 to 80 per cent, but as an emperor will live twenty-five or thirty years, the mortality of the chicks is not dangerous to the survival of the species.

The principal enemies are killer whales and the spotted seals known as sea leopards. Large blocks of ice falling from the ice cliffs above the colonies at times cause injury. During the summer molting period, in January and February, the emperors sit on the floating ice floes at the northern edge of their range. Their thick waterproof feather clothes are shaggy and unkempt and no longer adequate protection from the cold water and so they fast for a month or so while waiting for their feathers to grow.



Rare Birds from "Little America"

Largest of all species of penguins are the emperors. They are extremely rare in collections. This group, shown amid a reproduction of a scene in the south polar regions, has been placed on exhibition in Hall 20.

never even approach Cape Horn at the tip of South America. They are larger than any other birds except ostriches, rheas and their kin. A fat, full-grown emperor may stand about four feet high and weigh as much as 94 pounds—the size and weight of a ten-year old boy.

Perhaps the most amazing thing about emperor penguins is their nesting habits. They lay their eggs during the long antarctic winter when the sun is continuously below the horizon for five long months. Temperatures from 40 to 60 degrees below zero are normal, and blizzards and storms are frequent. Only one egg is laid by each hen. It is about five inches long, pale green and has a rough shell. On the grounded pack-ice, three to five miles from open water, there

Mawson Sees Antarctic Wealth for Australia

Explorer reports advent of airplane will give access to mineral deposits and help in development of other industries.

ADELAIDE, S. Aust.—Sir Douglas Mawson, who has led two expeditions to the Antarctic, foresees some isolated settlement on the Antarctic continent within a few years and the development of industries eventually, if this great enterprise is handled properly by Australia.

Three years ago an Order-in-Council was issued by the Imperial Government affirming that the King had sovereign rights over the Antarctic territory, and the land was placed under the authority of the Commonwealth. Under legislation recently passed the Commonwealth took over the territory as a dependency.

Rich Potentialities

What Sir Douglas is stressing is



Sir Douglas Mawson

that Australia has not taken possession of merely a vast white waste, but of a country with rich

potentialities. In a recent press interview this noted explorer and geologist emphasized that the territory covers an area of about 2,250,000 square miles and that at present the only commercial enterprise taking place there is whale fishing. Australia takes no part in this work, while Japanese and Norwegian whalers each year reap valuable harvests.

Sir Douglas expects that within a few years other fishing industries will develop. The seas round the area abound with marine life.

Airplanes for Transport

Sir Douglas says that although the broad outline of the land has been delineated, a great deal of detail exploration remains to be undertaken. It is known, however, that there are mineral deposits, which although as yet of only research interest, may lead to discoveries of economic importance.

The explorer believes that a factor which once would have militated against the development of mineral resources in Antarctic has now been removed.

"Until recently the only areas that could have been worked were those to which a ship could make its passage through loose pack-ice," said Sir Douglas. "Now, however, from isolated accessible points on the coast the remainder of the distance could be covered by plane.

"This opens up many possibilities, for it must be remembered that the richest radium mine in Canada is in the Arctic circle, and that transport to and from it is carried out only by plane."

Shore Development Needed

Australians could live all the year round in the territory Sir Douglas said. Until some shore development took place, however, he did not think that any permanent settlement would be made. Before long though several land stations undoubtedly would be formed.

If it were not shore fisheries that instituted permanent stations it might be working of mineral deposits. And there were other economic projects which might in time divert wealth to Australia from what is at present a no-man's land.

OSCAR WISTING, 65, EXPLORER, IS DEAD

Captain, Who Was Chief Aide to Amundsen, Found in Old Cabin Aboard Fram.

OSLO, Norway, Dec. 4 (AP).—Captain Oscar Wisting, who was Roald Amundsen's second in command on his polar expeditions, was found dead today of a heart attack in his old cabin on Amundsen's polar ship Fram, which had been installed permanently in the Bygge Museum here. He was 65 years old.

Captain Wisting was one of the four men chosen by Amundsen to accompany him across the ice to the South Pole in 1911.

Noted for His Fortitude

The fortitude and strength of Oscar Wisting were a legend among polar explorers, but these were not his only attributes. As right-hand man to Roald Amundsen he is credited in Norway as having had more to do with the famous explorer's achievements than any other one man. He was an able navigator, a craftsman who could turn his hand to any task and a wit whose humorous remarks and anecdotes served to save many a tense situation when men's nerves were frayed and their strength exhausted in the strenuous life of exploration.

Captain Wisting, who after his school days entered the navy, first attracted public notice when he was chosen by Amundsen to accompany him aboard the Fram on what started out to be an exploration of the North polar regions. That was in 1910. Amundsen suddenly changed his plans and went south. Wisting proved himself to be as good on foot as he had been on the bridge of a vessel in the long trek with Amundsen to the South Pole.

On their return Amundsen at once started preparations for another expedition north, but the World War intervened and plans were held in abeyance until 1918. In that year the Maud, a small rugged motor ship, left Seattle with Wisting in command. Amundsen's purpose was to lose himself in the polar ice pack, somewhere north of Point Barrow, and drift across the North Pole. Unfavorable conditions forced the Maud to winter three times on the Siberian coast and in 1921 she put back into Seattle.

Commanded the Maud

Captain Amundsen, balked in his plans to make scientific researches across the polar regions, decided to turn to the air, but with Wisting in command the Maud set forth again in June, 1922. At Herald Island ice formed around the ship and for nearly two years she was a prisoner. Winds carried her to the south and she had moved only to the De Long Islands when a wireless message from Amundsen instructed Wisting to give up the expedition and return.

It was a year later before the little ship was able to get into Nome. In the last two years of the Maud's drifting the crew of the Maud, eight men and a boy, saw no human beings save in March, 1925, when some half-breed Russians from the

Oslo Marks Anniversary Of Amundsen Discovery

OSLO, Norway, Dec. 14.—The twenty-fifth anniversary of Roald Amundsen's discovery of the South Pole was marked today by a meeting in the polar museum aboard Dr. Fridtjof Nansen's vessel Fram, in which tablets were unveiled in memory of Nansen and Captain Otto Sverdrup by Knud Ringnes, chairman of the Fram committee, and in memory of Amundsen by Knut Domaas.

Of the surviving members of the Amundsen expedition who reached the pole only Helmer Hanssen was present. Other members of the expedition at the meeting were Messrs. Stubberud, Karénus, Olsen and Bjaarland. Major Gunnar Isaachsen, who was with Amundsen during his northwest passage, and General Dietrichsen, sole survivor of Nansen's skiing expedition across the ice cap of Greenland in 1888, also attended.

Tonight the geographical society held a meeting at which King Haakon and Crown Prince Olaf were present.



Times Wide World Photo

CAPTAIN OSCAR WISTING

Kolymia River came aboard. When they did come back, however, they brought data for three years on Arctic weather which is still in use. They took observations six times daily of wind and weather and this material was used by Amundsen on his flight in the Norge across the North Pole.

Wisting was on board in that expedition and among his contributions was the sled carried by the Norge, one of the most beautiful pieces of craftsmanship of its kind ever put together. It was exhibited for a time at the American Museum of Natural History.

At the end of the Maud expedition Wisting went home to visit his family. He passed three weeks with his wife and four children, his first visit in eight years, and then joined Amundsen to help prepare for the

Amundsen Took 97 Days in Dash to Pole; Scott Out 148 Days When Death Came

Captain Roald Amundsen's dash of 1,738 miles to the South Pole and back in 1911-1912 required ninety-seven days.

Captain Robert F. Scott, on his ill-fated expedition undertaken almost at the same time as Amundsen's, covered the trip to the South Pole and back to within 155 miles of his base, a total of about 1,545 miles, in 148 days.

Captain Amundsen on his return trip had traveled about 225 miles when, apparently, he passed Scott some 135 miles away, pushing on toward the Pole.

Starting on Oct. 20, 1911, after having made and abandoned an earlier start on Sept. 8, from his base at Framheim, on the ice barrier on the Bay of Whales, not far from the site picked for Little America, Amundsen pushed on to success. He had abandoned his first start because of adverse weather conditions marked by extremely low temperatures, and had decided to wait for sure signs of Spring.

Amundsen estimated that his winter quarters were 869 miles from the Pole. He arrived at his objective on Dec. 14, having covered the distance in fifty-five days. The Norwegian estimated that his average daily speed on the way out was fifteen and a half miles.

He departed on the return trip on Dec. 17, 1911, the fourth day after his arrival, having spent the time making observations. He arrived back at Framheim on Jan. 25, 1912,

explorer's abortive attempt to fly across the North Pole by plane.

When that failed, Amundsen demanded a continuation of his leave from the Norwegian Navy for the Norge expedition on which Wisting, 56 years old, the oldest man on board, was on duty without let-up for seventy-two hours. That was in 1926, and with Amundsen he thought that his days of Arctic wandering were over.

However, when two years later his old chief lost his life in an attempt to go to the rescue of Nobile and the Italia after its flight to the Pole, Wisting was chosen to head a picked group of Norwegian seamen to go to Amundsen's rescue. Enough was found by joint expeditions of Russians, Frenchmen and Norwegians to show that Amundsen had crashed and was dead, and Wisting returned to Norway.

William Horlick Sr.

RACINE, Wis., Sept. 25.—William Horlick, founder and president of the Horlick Malted Milk Corporation, died at his home here today after an illness of two weeks. He was ninety years old.

All forms of scientific research interested him, particularly the exploration of the polar regions. He backed several of the late Roald Amundsen's expeditions to the North Pole and was made a Knight of St. Olaf by the King of Denmark in recognition of his services to science.

Mr. Horlick also contributed to Rear Admiral Richard E. Byrd's journeys to the Antarctic. The plane which Admiral Byrd used for his flight over the ice field from "Little America" was named the Horlick, and one of the areas discovered by the Byrd party near the South Pole also bore his name. Both polar explorers were close personal friends of Mr. Horlick, and visited him at his home on several occasions.

Surviving are his wife, a daughter, Mrs. Mabel Horlick Sidley, and two sons, William Horlick Jr., vice-president of the Horlick corporation, and A. J. Horlick, former Mayor of Racine.

having made the return trip in thirty-nine days. Amundsen estimated that his average daily speed on his return dash was 22.35 miles.

Captain Scott estimated that his base at Cape Evans was 850 miles from the Pole. He started on Nov. 2, 1911, with ponies, mules and dogs. On his way he passed motor sledges that had been abandoned by advance parties. Fighting his way through blizzards and frequently through slush, Captain Scott arrived at the Pole on Jan. 18, 1912, having covered the 850 miles in seventy-seven days.

Scott and his companions found the tent and records left by Amundsen. They also found dog tracks left by the Amundsen party, which would be lost at intervals in light snowdrifts. In their observations Scott and Amundsen were only half a mile apart in locating the Pole.

Captain Scott and his companions on their return trip were within 155 miles of their base at Cape Evans, when they were caught by a blizzard and perished, about March 29. They had spent seventy-one days on the return dash, making a total of 148 days in all. Captain Scott had estimated that he would have only 150 days of "traveling" weather.

Using much heavier equipment than Amundsen, Scott did not approach the Norwegian's daily speed in either direction. On his dash to the Pole he averaged eleven miles a day and on his return trip he averaged daily a little less than ten miles.

JOHN (BOSUN) MURPHY

Member of Crew on Ship Which Carried Peary to North Pole.

ST. JOHN'S, Nfld., Oct. 14 (AP).—John (Bosun) Murphy, a member of the crew of the ship which carried Peary on his successful trip to the North Pole, died today at the age of 64.

Mr. Murphy sailed with Peary on the ship Roosevelt, which left New York in July, 1908. With most of the crew he wintered at Cape Sheridan, remaining aboard when Commander Peary pushed on in the Spring to the Pole.

Mr. Murphy, who shipped with Peary and Captain Bob Bartlett, master of the Roosevelt, on several other Arctic explorations, had been an invalid for many years as a result of hardships in the Far North. His boast was that he got nearer the Pole than any other Newfoundlander.

His widow survives.

JAMES RITCHIE

Chief Engineer of Greely Arctic Expedition Rescue Ship.

NEWARK, N. J., Aug. 12 (AP).—James Ritchie of Arlington, chief engineer of the three-masted ship Proteus, which sailed to the rescue of the Greely Arctic expedition in 1882, died in Presbyterian Hospital today after an illness of several weeks. He was 78 years old.

The Proteus took the Greely expedition to Lady Franklin Bay and a year later went to the party's relief. It sank in the North Atlantic on the way back. Mr. Ritchie was among a group which passed two weeks adrift in a small boat.

He was born in Scotland, came to the United States in 1888 and worked as stationary engineer at a Kearny, N. J., factory until retirement this year.

Charcot Goes Down With Ship And 32 of Crew in Iceland Gale

Discoverer of Lands in Antarctic and Arctic Washed Overboard.

REYKJAVIK, Iceland, Sept. 16.—A howling seventy-mile gale blew the famous polar research ship *Pourquoi-Pas* onto the rocks of Western Iceland this morning and cost the lives of Dr. Jean Baptiste Charcot, veteran French explorer, and thirty-two of his men.

Dr. Charcot's 449-ton steamer, which had weathered Arctic and Antarctic storms for almost thirty years, was battered to pieces. Giant waves swept the men one by one from the decks into the sea.

Early this morning the inhabitants of hamlets on the desolate Alftanes coast found wreckage floating in the water and a life-belt bearing the name "Pourquoi Pas" on the shore. A little later they saw what looked like the body of a man lashed to a cabin door, floating amid a mass of timber wreckage.

Only Survivor of Disaster

He was unconscious but still alive—the only survivor of the thirty-four who had sailed from Reykjavik on the previous day. He was taken to the nearest farmhouse, where he was then able only to murmur his name, Eugene Gouidec, and a few words. After he had been wrapped in warm blankets and drunk some coffee he fell into a death-like sleep.

Word of the tragedy soon spread up and down the coast. Among the bodies washed ashore was the familiar, bearded figure of Dr. Charcot, pioneer of Antarctic exploration and in recent years the discoverer of vast tracts of unmapped territory in Greenland. Reykjavik was stunned by the news, for Dr. Charcot was something of a hero with Icelanders. At 69 he was probably the oldest polar explorer still on active service, and his fearlessness made him known here as "the French Amundsen."

The *Pourquoi-Pas* was on the last stage of a long voyage from Greenland, where she had picked up members of the Franco-Swiss expedition, who had just crossed the inland icecap. The ship had left Reykjavik yesterday afternoon and headed northwest through Faxa Fjord, intending to turn southwest. In the evening the wind rose, and as the expedition was in no hurry it is believed the captain intended to avoid the hurricane, which was already raging at sixty-five miles an hour.

But apparently the high wind and strong current had forced the *Pourquoi-Pas* so much off her course

that her navigators mistook Akranes Lighthouse, north of the scene of the disaster, for Ropta Light, near Reykjavik. The position of the wreck seems to substantiate this theory, for even a 70-mile wind would not have been enough in itself to account for the tragedy.

Only one mast of the *Pourquoi-Pas* is left showing above the waves. Three ships that had been rushed from Reykjavik were tossing near the scene of the wreck this afternoon, searching for survivors, but the remains of Dr. Charcot's little vessel were hidden from sight repeatedly by the huge waves.

By nightfall the Danish sloop *Hvidbjørnen* [White Bear] and the Icelandic gunboat *Aegir* picked up twenty-four bodies, all wearing lifebelts. This seemed to indicate the ship began to sink immediately after striking the rocks and that the crew could not launch lifeboats in the raging seas.

In addition to bodies picked up from the waves, six others were washed ashore. Thus four are still unaccounted for, but no hope is held that they could have survived in the tremendous seas that battered the coast all day.

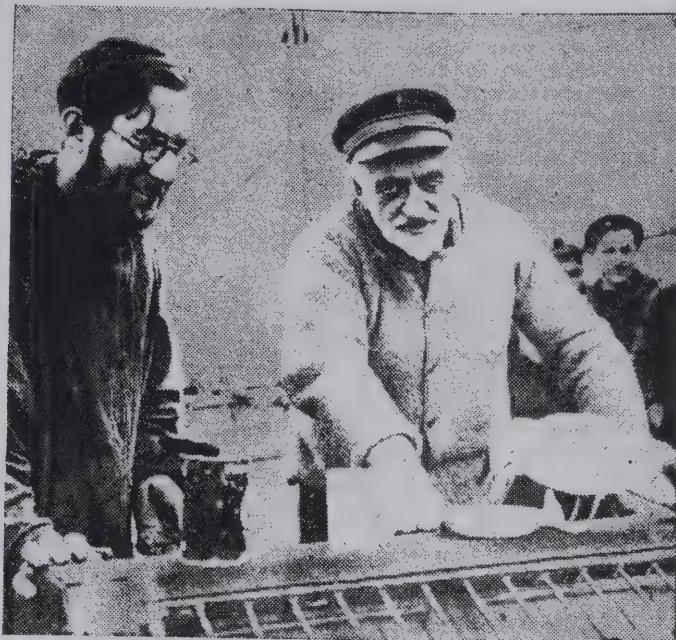
COPENHAGEN, Denmark, Sept. 16.—The storm that sank the *Pourquoi-Pas* was so severe it sent all shipping around Iceland scurrying into the harbor and blew down telegraph and telephone lines from Seydisfjord, on the northeast part of the island, to Reykjavik. As a result Iceland is virtually cut off from the outer world and only fragmentary accounts of the disaster have reached the Danish Greenland Board here tonight.

It was a crowning irony that at the age of 69 and after a brilliant career as an explorer Dr. Jean Baptiste Charcot should have met his end near a friendly harbor and on a coast he knew like an open book. He was on his way home to France after having picked up members of the Franco-Swiss Greenland expedition who had recently crossed the ice cap of Inner Greenland.

At first it was feared the Greenland explorers, too, had been lost with Dr. Charcot aboard the *Pourquoi-Pas*. Later, however, it was learned most of them had transshipped at Reykjavik last week and were safe aboard the Danish mail steamer *Gertrud Rask*, now on her way to Copenhagen. Three others, including a British explorer, are still at Angmagssalik, Greenland, where they will spend the Winter.

Bad luck had followed Dr. Charcot almost from the moment he left Greenland with his passengers. His ship developed boiler trouble on Aug. 30, when in Denmark Strait, between Greenland and Iceland, and sent out a call for help. The Danish sloop *Hvidbjørnen* hurried to the rescue and on Sept. 1 began towing the *Pourquoi-Pas* to Reykjavik.

Dr. Charcot had to stay in port a fortnight until the ship's boilers could be repaired. His passengers then decided to proceed to Europe by the first available ship. Dr. Charcot, however, was in no hurry.



Times Wide World Photo.

THE LAST PICTURE OF COMMANDER CHARCOT

The French explorer, who recently died in the Arctic with all of the members of his expedition but one, shown feeding a pet seagull aboard his ship, the *Pourquoi Pas*, at Scoresby Sound, Greenland, while his scientific chief, M. Jacquier, who also lost his life, looks on.

He intended to go to Copenhagen, where he was to have been the guest of the Royal Danish Geographical Society at a reception at the end of this month and he was to have received a gold medal for his explorations.

In any event, this was to have been his last expedition. He had been traveling in the polar regions more than thirty years.

Premier Thorvald Stauning tonight expressed the sorrow of the Danish people at the loss of "this highly esteemed French scientist, this good friend of Denmark, who gave us support of great value during our dispute with Norway over the possession of Greenland a few years ago."

CHARCOT SHIP LOST BEARINGS IN STORM

Paris Orders Vessel to Bring the Bodies Home—Survivor Adds Details of the Crash.

COPENHAGEN, Denmark, Sept. 17.—The bodies of Dr. Jean-Baptiste Charcot, French polar explorer, and twenty-two other victims of the *Pourquoi-Pas* disaster lay tonight in the chapel of the Catholic Hospital at Reykjavik, Iceland, while a French destroyer was ordered to speed north to bring them home.

Sixteen other bodies, not yet recovered, bring the total death roll to thirty-nine. Most of those lost were simple sailors from Saint Malo, France; but in addition to Dr. Charcot there were four scientists and a motion picture camera man.

It was learned today that Professor de Vaux, eminent French

physicist; Dr. Larronde, secretary general of the French Geographical Society, and Professors Parat and Jacquier of the Sorbonne went down with Dr. Charcot in yesterday's tragedy.

Before being taken to Reykjavik the bodies were placed in a row on a grassy slope in front of the farm at Straumfjord, where Eugene Gouidec, sole survivor, is being nursed back to health. Dr. Charcot was still in a blue travel suit and his characteristic black collar and tie. The clothing of some of the bodies showed the men had dressed hurriedly when the *Pourquoi-Pas* was wrecked.

Some had been badly hurt by being flung against the rocks, but others were strangely untouched. Thus Professor Parat was still wearing his spectacles, which were unbroken when his body was found. Waves dashing upon the rocks were full of wreckage, but neither the ship's books nor Dr. Charcot's valuable scientific papers have yet been recovered.

Gouidec gradually recovered today from his five-hour ordeal in the raging sea and was able for the first time to tell a fairly connected story of what happened. His eyes were so swollen by the salt water that he could hardly see. Speaking slowly and almost inaudibly he told one reporter the ship's boiler burst soon after he was swept into the sea, but later he contradicted this statement.

The ship was literally split to pieces but whether this was due to rocks or an exploding boiler cannot be learned until the wind and sea have died down.

"At 1 o'clock yesterday morning," said Gouidec, "we arrived at Gard-

skagi Lighthouse, north of Reykjavik, and as the wind was rising every minute Captain Le Conninat decided to turn back to Reykjavik. I went down to my cabin and slept for some time.

"At about 4 A. M. I was on deck again and learned the captain had lost his bearings, having mistaken Akranes Lighthouse for Seltjarnarnes Lighthouse to the west of Reykjavik. I was told to go down and fetch the charts.

"As I reached the chartroom there was a deafening noise and I was thrown to the floor as the Pourquoi-Pas rolled over. She had struck a submerged rock and soon afterward the engine stopped as water poured into the engineroom.

"The captain tried to set the sails to get the ship away from the dangerous rocks, but we failed, and the Pourquoi-Pas was dashed against rock after rock. Finally when we crashed against Hnokki Rock, two and a half miles from shore, the foremast broke and the fore part of the ship was crushed.

Try to Lower Lifeboats

"The captain told us to fix on our lifebelts and save ourselves as best we could. We tried to use the pumps, but it was useless. Then we tried to lower boats, but our one big lifeboat and four smaller ones sank or overturned.

"The waves crashed every one of the smaller lifeboats against the side of the Pourquoi-Pas. I was thrown into the water from one of them and caught hold of a piece of wreckage.

"Dr. Charcot was standing calmly on the bridge alongside the captain. One of my comrades clung to the same piece of wreckage that I had hold of, but after some time—I do not know how long—he disappeared. I could not do anything to hold him.

"All I remember after that is interminable tossing on the waves. They say I floated four hours, but I do not know. I vaguely remember terrific surf, and that I tried to swim ashore—that is all."

Experienced Icelandic sailors said today the scene of the disaster was one of the most dangerous places on the Icelandic coast. Normally it is only one hour's sailing from Reykjavik, and on a clear night the city lights are plainly visible from the scene.

FRENCH SCIENTISTS GRIEVE

Charcot Had Become Symbol of Gallic Spirit of Exploration.

PARIS, Sept. 16.—The death of Dr. Jean Baptiste Charcot and the destruction of his gallant ship, the Pourquoi-Pas, in a storm off Iceland has brought consternation to the scientific world in France.

For twenty-eight years the ship carried the French flag from one polar region to the other, and Dr. Charcot had become the symbol of the Gallic spirit of exploration in the same way Scott represented Britain and Peary the United States.

The commander of the Pourquoi-Pas was named Le Conninat. The ship sailed from Saint Malo, France, June 22, to take aboard a Swedish mission and conduct them to Greenland.

In 1908 Dr. Charcot built the Pourquoi-Pas, then considered the last word of her type. He took her on a successful two-year trip to the Antarctic, finding about 2,250 miles of hitherto unknown coast-



Times Wide World Photo.

Dr. Jean Baptiste Charcot, who, with thirty-two others, was drowned when the Pourquoi-Pas sank.

line.

That trip made him famous, and every year thereafter he organized voyages to one or the other of the polar regions, adding greatly to the lore of the natural history, oceanography and topography of those lands.

He spent the Summer of 1928 vainly searching for Roald Amundsen, who had disappeared on a flight north to find Nobile.

In recent years the Pourquoi-Pas had been used on behalf of the French Museum of Natural History on many official missions.

U. S. Society Pays Tribute

The American Polar Society, through its president, Paul Siple, of Erie, Pa., a veteran of both Byrd Antarctic expeditions, paid tribute Sept. 17 to Dr. Charcot. The tribute follows:

"The American Polar Society grieves the loss of Dr. Jean B. Charcot as one of its distinguished charter members. His untimely end takes from polar exploration one of its outstanding figures in recent years. Dr. Charcot expressed his keen interest in the work of the Byrd and Ellsworth expeditions in Antarctica when he became a member of this society at the time of its founding more than a year and a half ago."

Paris to Name Street for Charcot

PARIS, Sept. 17.—The death of Dr. Jean-Baptiste Charcot and the destruction of the Polar ship Pourquoi-Pas continued to fill columns of all newspapers today.

Alphonse Gassier-Duparc, Minister of Marine, has ordered a destroyer and a naval transport to go to Reykjavik to bring back the bodies that have been recovered. Already preparations are being made to name a street in Paris after Dr. Charcot.

From everywhere in the world came condolences today to Mrs. Waldeck Rousseau, Dr. Charcot's sister, and to scientific societies of which he was a member.

DR. CHARCOT ADDED MUCH TO THE MAP

Forsook Medicine to Undertake Explorations in Antarctic and in the Arctic.

A medical career that promised to equal that of his illustrious father was broken off abruptly when Dr. Jean Charcot forsook his profession and succumbed to the lure of exploration. He had been the head of the clinics at the faculty of medicine of the University of Paris and had served with the Pasteur Institute, when, in 1903, he started for the Antarctic on his first expedition, aboard the small vessel *Français*.

That expedition, and more particularly his second trip to the unknown regions of the South, resulted in much scientific discovery, and in the South Atlantic is the large barren Charcot Island, which he discovered on his second expedition.

Discovered Island in 1910

Charcot Island, at first thought to be part of a great continent, was sighted by Dr. Charcot and his companions in 1910 when he cruised aboard the Pourquoi-Pas. In his book, "The Voyage of the Why Not [Pourquois-Pas]," Dr. Charcot wrote a vivid account of the thirty-odd months spent in Antarctic scientific venture, part of it written in diary form. His discoveries, besides the purely geographical, led to new light being shed on geology, glaciology, meteorology, fauna, flora and marine life.

When the little vessel returned to Punta Arenas, Chile, it was thought at first that he had discovered the South Pole. A headline in a New York newspaper said:

"Dr. Charcot, French explorer, spoken to in Magellan Strait, maintains a mysterious, suggestive silence."

The two Antarctic expeditions were made in pre-radio days. Dr. Charcot and his men went through the same difficulties as the early travelers—suffered from lack of food, scurvy and ennui. His subsequent voyages of exploration were chiefly in the Arctic, in the waters around Rockall and in the Greenland seas.

Jean Baptiste Etienne Auguste Charcot was born at Neuilly, near Paris, in 1867. His father was Professor Jean Martin Charcot, one of the greatest of French physicians and men of science. After attending the Ecole Alsacienne in Paris he served as an interne in Paris hospitals from 1890 to 1894 and was attached to the Pasteur Institute for three years.

Quick Rise in Medicine

He had practiced medicine for only six years when he was appointed head of the clinics at the University of Paris, an unprecedented thing. Then he suddenly left, never to return to his old profession.

The first expedition was from 1903 to 1905, the second from 1908 to 1910. The Pourquoi-Pas reached Deception Island in the Antarctic

in December, 1908. After exploring the Southern Shetlands, Dr. Charcot reached Weddell Island on Jan. 1, 1909. Accompanied by three others he set out in a launch to find a better anchorage. This was discovered on Petermann Island.

Working from that base, Dr. Charcot and his companions explored the surrounding territory. They found Matha Ba. Adelaide Island was measured and found to be seventy miles long instead of eight, as previously charted. South of Adelaide Island a great gulf was discovered in a region never before seen.

The ship stranded on the coast of Graham Island, but was refloated after three days. She was in collision with icebergs, and her rudder was lost. A jury rudder was constructed. The thrills were many in the Summer of 1909, when they saw 10,000 icebergs in the region west of Graham Land.

The true geographical status of Charcot Island (or Charcot Land, as it is sometimes called) was ascertained by Sir Hubert Wilkins in 1929. It had been set down on the map as part of the continent; it proved to be an island outpost.

During the World War Dr. Charcot was a commander in the French Navy and received the Croix de Guerre with palms and the Distinguished Service Cross. He was an honorary capitaine de frégate in the navy.

Received Many Awards

Dr. Charcot has received many medals and awards, including the Cullum Medal of the American Geographical Society. He went North in his little ship at the time when Captain Roald Amundsen was lost to search for his friend. In latter years, besides his exploration work along the Greenland coast, Dr. Charcot conducted hydrographical observations in the Bay of Biscay. He established weather stations in Greenland and studied the folklore of the Eskimo.

Among his many books were "Autour du Pole Sud," in two volumes; "Christophe Colomb Vu Par Un Marin," and many medical works.

He was a member of the Institut de France, of the Academy of Medicine and the Marine Academy. He was scientific counsel to the Naval Hydrographic Service and director of the Maritime Laboratory of the Hautes Etudes.

Explorers Haul Dogsleds In 47-Day Life Struggle

French Party Crosses Greenland After Animals Give Out

PARIS, July 15 (UP).—An epic of the North was related fragmentarily today in a wireless message from the French Trans-Greenland Expedition, headed by Paul-Emile Victor.

The message said the expedition had reached Angmassalik, on the east coast of Greenland, after forty-seven days of struggling across the ice cap from the west coast. The dogs had been worn out rapidly on twenty-hour marches and finally were abandoned in a tempest. The men then threw away all but essential supplies and dragged the sleds.

The exploring party, which sailed from France on the polar ship Pourquoi Pas, includes Dr. Robert Gessen, anthropologist, and Michael Perez, mapmaker and geologist.

Two Charcot Men at Copenhagen

COPENHAGEN, Denmark, Sept. 18.—A silent crowd watched the berthing here today of the Gertrud,

Rask, a frigate-rigged steamer with a massive ice-breaking bow.

The arrival of any ship from the remote East Greenland colonies is always an event, but in view of the Gertrud Rask's association with Dr. Jean Baptiste Charcot's ill-fated Pourquois-Pas and the fact that she carried two members of Dr. Charcot's expedition, the crowd decided to pay a silent tribute.

The two men who escaped the fate of their comrades were a Frenchman, Dr. Robert Gessain, and a Swiss, Michel Perez, who finished their trek over the Greenland ice on July 5. They reached Angmagssalik on July 10. The Pourquois-Pas arrived there on Aug. 4 to take them aboard, but they asked Dr. Charcot that they be allowed to await the Gertrud Rask, thereby gaining an extra month in which to complete their work.

Charcot Called Fatherly

"It was hard for us to leave the Pourquois-Pas," they told your correspondent, "and at the last moment we told Dr. Charcot that we preferred to accompany him further north, but like the good, wise father he always was to us, he said:

"No, boys, if Danish courtesy gives you a chance for an extra month's work on the spot, you stay here, and the Gertrud Rask will take you to Copenhagen. Adieu, we'll meet there."

"We saw him leave Scoresby Sound standing on the bridge, where he was always to be found. It was typical of him to choose that spot on the bridge by the side of the captain when the Pourquois-Pas went down."

ICELAND HOLDS RITES FOR CHARCOT'S PARTY

Bodies of Shipwreck Victims Are Then Put on a Transport to Be Sent Back to France.

REYKJAVIK, Iceland, Sept. 18.—The twenty-two bodies recovered from the wreck of Dr. Jean Baptiste Charcot's exploration ship Pourquois-Pas, which had been lying at Straumfjord, today were taken aboard the fishing boat Aegir for removal to Reykjavik. The Aegir had to hammer her way through high seas and it was not until late at night that she entered the harbor, while bells tolled and 2,000 stood silent at the quayside, including Iceland's Prime Minister, Jon Jonasson, and Bishop Meulenberg of the Catholic Church.

Eugene Gouidec, sole survivor of the disaster, accompanied the bodies of his comrades to Reykjavik, where he will enter a hospital. Gouidec said today he saw Dr. Charcot leave the bridge of the Pourquois-Pas, open the cage of the seagull kept by him as a good omen and watch it fly away. Then he walked back to the bridge, where he stood as the ship went down.

Articles from the Pourquois-Pas are still being recovered, many of them undamaged.

COPENHAGEN, Denmark, Sept. 30.—A memorial service was held at the cathedral in Reykjavik, Iceland, today for the victims of the sinking of the French exploration ship Pourquois-Pas.

The twenty-two bodies recovered, including that of the famous French explorer Jean Baptiste Charcot, were placed in coffins, which were borne into the cathedral by sailors from the French warship Audeux.

Bodies of Charcot and Aides Returned Home; Bells Toll as the Ship Enters Old Breton Port

SAINT-MALO, France, Oct. 10.—On board the transport ship Aude the bodies of Dr. Jean Baptiste Charcot and twenty-one officers and men who perished with him in the wreck of their exploration ship Pourquois-Pas were brought back today to this old port, from which they had so often sailed forth.

All the bells of the churches of Saint-Malo, Dinard, Paramé and Saint-Servan, where Dr. Charcot had his home, tolled for their return. They will receive a national funeral at Notre Dame, Paris, on Monday, but here in their home port they received today that tribute of universal grief which is greater than an official ceremony.

Saint-Malo and Saint-Servan were immensely proud of the Pourquois-Pas, its captain and its crew. They all belonged here, they were all Bretons. They gave glory to the

old harbor from which much of its former glory has long departed.

On the quayside all together were the widows and families of these men who perished together in the wild seas of Iceland. They watched the transport as it came over the sea, which was waveless and a brilliant blue in the Autumn sunlight.

Dr. Charcot's passion for the sea is in the heart of every Breton, who knows also its tragedy. He and his men had seemed to be beyond the fate of those who go down to the sea in ships, but that fate has struck them too.

Holding his wife's hand and standing apart from the mourners but even more grief-stricken than they, was Eugene Gouidec, the only survivor of that last expedition. To him it all seemed unreal and impossible that the sea should have taken these twenty-two shipmates and left him alone.

At the ceremonies were Icelandic officials and representatives of foreign governments, and also fishermen and peasants from Strumfjord, who had rescued and nursed the sole survivor, Eugen Gouidec.

After mass had been held, the bodies were taken aboard the French transport Aude to be taken back to France.

Steffansson Mourns Loss

REYKJAVIK, Iceland, Sept. 17.—One of the victims of the Pourquois-Pas disaster was a seagull that had flown aboard the ship off Greenland and had been kept by Dr. Jean-Baptiste Charcot as a bird of good omen.

This story was told tonight by Dr. Charcot's old friend, Vilhjalmur Steffansson, American polar explorer, who is in Reykjavik supervising radio research for Pan American Airways and collecting material for a book. Mr. Steffansson spent a whole day aboard the Pourquois-Pas before she sailed on her last voyage.

"I remember how affectionately Dr. Charcot showed me that seagull," said Mr. Steffansson. "It had flown aboard exhausted but uninjured near Greenland and refused to leave. Dr. Charcot gave the bird the freedom of the ship during the day, but locked it in a cage at night. He called it an omen of good luck that this Greenland bird had taken passage with him on the long voyage to France, and he was confident it would return to Greenland with the Pourquois-Pas next Spring."

Mr. Steffansson was deeply affected by the tragedy.

"In my opinion," he said, "Dr. Charcot was one of the two or three foremost polar explorers and probably the best loved of them all. When I saw him a few days ago he was enthusiastic about the results of this, his twelfth and last voyage to Greenland.

"The season had been remarkably favorable, for, although there were many icebergs, there had not been a single piece of sea ice in Scoresby Sound. As a result, Dr. Charcot had been able to map and study regions either never before reached or only hastily and inadequately.

ELSWORTH RECOUNTS HIS TALK WITH KING

Says They Discussed 'Everything in General' but Especially Antarctic Exploration.

Lincoln Ellsworth, Polar explorer, returned Dec. 10 on the North German Lloyd liner Bremen from London where he delivered a lecture on Antarctica before the Royal Geographical Society. He said that he had had a thirty-five-minute conversation with King Edward VIII at Buckingham Palace on Dec. 1 on the subject of Polar expeditions.

"The King was calm, sociable and very nice. It was the first time I had met him," Mr. Ellsworth said. "After hearing about our hardships the King laughed and said he did not think he would care for Polar explorations."

"The King looked immensely fit," he said. "We had a long conversation, about three-quarters of an hour, and he struck me as an awfully nice man. I really was impressed by his friendliness, and the King certainly looked completely unworried."

"We talked about everything in general, but notably about Antarctic exploration. I told him all my interest is in the Antarctic again and that I am planning a further expedition. This seemed to excite his attention to a surprising degree."

Mr. Ellsworth was in London for ten days and was the guest of honor at the annual Thanksgiving reception given by the American Club of London.

ELSWORTH WINS MEDAL

Chicago Geographic Society Honors Polar Explorer.

CHICAGO, Oct. 24 (AP).—Lincoln Ellsworth, participant in several polar expeditions and navigator on a flight across the Antarctic Continent last year, received a gold medal today from the Geographic Society of Chicago. The explorer, at a luncheon in his honor, told the society that there was much "left undone" and that the ice-bound Antarctic fastnesses hold large reserves of minerals, which some day may be tapped by man.

Among others who have won the society's award were Captain Roald Amundsen, Dr. James Henry Breasted, Dr. Fay-Cooper Cole, Rear Admiral Richard Byrd and Laurence Gould, the latter receiving the last medal given, in 1931.

Memorial to Norse Explorers

OSLO (S. S.)—Norway plans a mountain sculpture of heroic proportions, like the great American carvings in the Black Hills and elsewhere. The Norwegian project is to carve a towering spur of granite overhanging the entrance to the far northern part of Bergen into a monumental memorial to Norse explorers who have pushed their way to the North and South Poles.

Crossing the great ice cap mountain ranges at an altitude sometimes 10,000 feet, the explorers were entirely cut off from communication with the world for seven weeks. Nothing was heard from them until their recent arrival at Angmagssalik, the principal settlement on the east coast of Greenland.

NEW ESKIMO LINKS TO ASIA DISCOVERED

Bone Armor 1,000 Years Old and Other Artifacts Are Dug Up by Archaeologists.

WASHINGTON, Oct. 7.—Armor made of slats of bone, similar to that worn by some Asiatic tribes, has been found in the frozen soil of Alaska by a joint expedition of the National Geographic Society and the Smithsonian Institution.

The armor, said to be about 1,000 years old, will fill in gaps in the history of the ancestors of the modern Eskimo, archaeologists of the expedition believe.

The finds were made near Cape Prince of Wales, the westernmost point of the American Continent. Harpoon and arrow heads, fish lines of flexible whalebone, fragments of clothing, cooking utensils, combs, awls, needles, ceremonial masks and toys carved in exact imitation of boats and animals were also unearthed in mounds.

Henry B. Collins Jr. of the Smithsonian Institution headed his expedition, which worked during the past Summer. James A. Ford of Louisiana State University and Harrison Prindle of Washington assisted him.

Thule Culture Site Found

The archaeologists uncovered the first site of the old Eskimo Thule culture ever found in Alaska. The Thule culture was the stage of development attained by the Eskimos previous to the stage they had reached when found by the first white explorers, and is characterized by certain types of tools,

weapons and art objects.

This culture spread all over Arctic North America and even to Greenland. While it has been known to exist in those regions for some time, the new finds confirm the important fact that it spread eastward from Alaska. These proofs were found in a mound located previously by Dr. Diamond Jenness of the National Museum of Canada, who made the first systematic excavations in Arctic Alaska.

In the same mound the expedition found evidence that the Thule culture was derived from a still earlier one known as the Birknirk culture, which once flourished in the region of Point Barrow. In successive layers downward in the mound, harpoon heads gradually changed from the Thule style to that of the Birknirk type. This establishes continuity between the two cultures and closes a gap that previously existed between them.

Story Is Pieced Together

Two miles from this location the archaeologists found another, older mound, in which the remains were entirely of the Birknirk type. This was the first discovery of a site of the Birknirk culture outside the Point Barrow region. In other mounds the expedition found remains of more recent times and thus was able to piece together a complete picture of Eskimo development in that locality over many centuries.

In addition, Mr. Ford made an archaeological survey along the North Alaskan Coast between Kotzebue and Point Barrow, northernmost settlement under the American flag.

Cape Prince of Wales, the expedition's headquarters, extends within fifty-six miles of Siberia and is a strategic point for excavating prehistoric remains because it was on the logical immigration route of the ancient Eskimos back and forth between Siberia and Alaska. Most scientists are convinced that North America originally was peopled by migrations over this route from Asia.

OLIVER L. FASSIG, 76, DIES IN WASHINGTON

Served in Weather Bureau for 53 Years—With the Ziegler Arctic Relief Expedition.

WASHINGTON, Dec. 6 (AP)—Oliver L. Fassig, former head of the Weather Bureau's division of climatology and a member of the Ziegler Arctic relief expedition in 1905, died today in Emergency Hospital. His age was 76. He was struck by an automobile on Nov. 20.

Mr. Fassig was graduated from Ohio State University, studied later at Yale and the University of Berlin, and received a Ph. D. degree from Johns Hopkins.

A member of the government's weather service since 1883, he served as Maryland State meteorologist for a time, and taught at Johns Hopkins, the Army Signal Corps School of Meteorology in Texas and in the School of Tropical Medicine, University of Puerto Rico. He was in charge of the Weather Bureau West Indies and Caribbean service from 1919 to 1930. He lived here at the Cosmos Club.

In 1898 Mr. Fassig married Ann Green McCoy of Annapolis, Md.

Peary Memorial Planned On a Maine Promontory

By The Associated Press.

FRYEBURG, Me., Oct. 24.—Jockey Cap, a bold rock promontory rising from the plain outside this Western Maine village, will be the site of a memorial to Admiral Robert E. Peary, discoverer of the North Pole.

His widow, Mrs. Josephine D. Peary, said today that a range-finder atop the natural observation tower would commemorate the days when Peary surveyed in this region.

Peary spent several of his youthful years in this town, which was his mother's home.

Doctor Expects White Men to Inhabit Arctic

Dr. Victor E. Levine, Professor of Biological Chemistry and Nutrition at Creighton University, who has visited the Arctic three times for research among the Eskimos, predicted that in the future the vast Arctic expanse would become the home of millions of white persons, "who can live there in complete health and comfort." Alaska, alone, he said can "easily maintain" a population of 10,000,000 to 20,000,000 persons. The climate of the Arctic is healthful and invigorating and suitable for the maintenance of vast populations "to the same old age" as those living in temperate climates, he declared.

"The span of life among the Eskimos is lower than that among

whites living in the Arctic, but the Eskimo's life span can be readily improved by proper sanitation, proper diet and by developing artificial and natural immunity against infectious diseases," Dr. Levine added. "We have found that the average Eskimo has a blood pressure considerably lower than that of the white persons of the same age. This is a direct refutation of the argument that excessive meat eating—a practice among almost all Eskimos—has a tendency to produce high blood pressure."

Of the 3,000 Eskimos he has examined in his three visits to the Arctic, only one was overweight, Dr. Levine, who is a member of the Explorers' Club, reported.

SANTA VISITS ESKIMOS

Arctic Natives Join Whites in Christmas Fetes in Outposts.

BARROW, Alaska, Dec. 25 (AP).—Santa Claus stopped off at this Arctic outpost on his dash southward and left Eskimos and a few whites singing his praises today.

What natives and whites there are along these lonely shores gathered in the Barrow Mission Church with the Rev. Frederick K. Kerker and Dr. Raymond Mauer, government physician, to receive gifts off a Christmas tree built of reindeer horns.

After the Barrow stop, Santa soared through the Arctic night to other settlements, among them Stebbins, Alaska, in the Koyukuk, where natives are even more primitive than the Northern Eskimos.

There the children sang in Eskimo, "Oh, Come, All Ye Faithful." All the faithful came, chewing blubber, tobacco or candy, as their tastes suggested.

The few Christmas cards sent by white residents to the Eskimos were tacked up on hut walls. Some Eskimos, unable to read, learned the inscriptions by heart and recited them for others.

ONE FISH IS MOVIE FEE

Alaska Theatre Sets Admission Price for Winter Season.

BETHEL, Alaska (AP).—An Eskimo boy paraded the mile-long two-plank sidewalk of Bethel's "Main Street" recently, ringing a cowbell and turning himself proudly so all could read the legend emblazoned on his sandwich boards: "Moving Pictures Today—Admission One Fish."

Bethel's inhabitants, 20 whites and 200 Eskimos, by this sign knew "civilization" had reached the Kuskokwim River country. The Northern Commercial Company trading post manager arranged it last August, when the last boat of the season brought enough talking pictures to last on a twice-a-week basis until navigation reopens next June.

The admission charge of one fish leaves it optional with the Eskimo movie patrons whether they pay one smoked salmon or one smoked whitefish, full size. The smoked fish, staple diet of sledge dogs, is later sold by the trader to dog drivers for cash.

Greenland Party Reports After 9 Months

REYKJAVIK, Iceland, Aug. 3.—After nine months of silence, a radio message has been received from the British East Greenland expedition under the leadership of L. R. Wager, which left Aberdeen, Scotland, April 7, 1935, aboard Sir Ernest Shackleton's old ship, the Quest. The party succeeded last Summer in ascending the highest peak of the biggest mountain mass in Greenland, Watkins Range, named after the late H. K. Watkins.

Members of the expedition, consisting of five men and two women, whites, and fifteen Eskimos, one of whom was born in camp, have remained in the Arctic throughout the Winter. All are well. They have carried out a full program of geological and botanical work.

Mr. and Mrs. Harold Wager and P. Chambers are carrying out botanical work among the Watkins Mountains. Dr. E. C. Fountaine, W. A. Deer and Mr. and Mrs. L. R. Wager are making whaleboat journeys to complete their geological survey.

Two routes through the mountain zone onto the icecap have been discovered. Two sledge journeys, each of 400 miles, have been made, one in the early Spring when the temperature was 50 degrees below zero.

The midwinter weather was astonishingly free from storms. Sledging journeys, sometimes with Eskimos, were made on the sea ice in December and January when the sun was below the horizon. The Watkins food dump, put down in 1930, was reached, but it had been damaged by a wave produced by the caving in of the Kangerdlugssuk Glacier.

Fifteen feet of snow fell in the first fortnight of May, and one party then traveling was without food for five days.

The expedition will leave for Iceland in three weeks.

Part of the work of the British East Greenland expedition was to survey possible air routes between Europe and America.

L. R. Wager was with a similar expedition in 1931 and in 1933 was with an expedition that attempted to reach the top of Mount Everest from India.

The second Greenland expedition started more than a year ago in association with a Danish expedition. Together they scaled a mountain known as Kange Raluksuak, which rises 13,000 feet.

One of the members of the expedition was Augustine Courtauld, who was marooned for five months on the Greenland icecap in 1930.

Line Separating Life and Death Sought in Arctic-Frozen Plants

By The Associated Press

MOSCOW, Sept. 19.—Soviet scientists, using nature's refrigerator in the arctic for their experiments, are seeking to locate the absolute boundary between life and death.

Old precepts that the line was clearly defined already have been shattered by their success in reviving plant organisms known to have been frozen solid from 1,000 to 3,000 years in the land of perpetual ice. Now the All-Union Academy of Sciences is experimenting to revive "dead" organisms of even greater antiquity.

Nature north of the Arctic Circle has provided an ideal workshop, for there scientists need but dig two or three meters to strike the zone of perpetual ice fifty to sixty meters thick.

In this frozen stratum nature has stored for centuries frozen "lifeless" plant and animal organisms, which may be dead or in a state of suspension. Preliminary success has crowned efforts to revive plant organism taken from a hole 3.5 meters deep in a meadow near the Skovorodino ice station, in the Arctic. At this level, about a meter below the thawed ground, the scientists found a layer containing remains of darkened but not yet entirely decayed grass-like plants, the remains of a peat bog. Samples sent to a laboratory began to revive and show traces of green within fifteen days.

Professor P. N. Kapterev describes the experiment thus:

"Through the microscope the specimens appeared to be lower forms of seaweed of various types. Some of them were unicellular, others were threadlike in the form of long slivers composed of one row of cells.

"Within a few months the soil in that same jar began to produce green moss. As a result of our experiments it may be said that there is really a possibility of resuscitating organisms long after they have been frozen."

Kapterev thinks the "age of the organisms brought to life must be calculated not by hundreds but by thousands of years. We would say from 1,000 to 3,000 years."

Disappointed because the revived plants were contemporary with existing life on earth, the scientists nevertheless were spurred to probe further to bring to life organisms that have disappeared from the earth.

5 ENGLISH EXPLORERS OFF FOR ARCTIC 'EXILE'

Royal Geographical Expedition Sails From Manitoba for 3 Years of Research.

CHURCHILL, Man. (Reuters).—Five young English varsity graduates have sailed from here in their whaleboat, Polecat, into three years of exile in Canada's "Frozen North."

They are members of the Royal Geographical Society's British-Canadian Arctic Expedition under the leadership of 24-year-old Thomas Manning, who recently spent two years of solitude on Southampton Island, 500 miles north of here. Other members of the expedition are Messrs. Patrick Baird, Raynold Bray, Graham Rowley and Dr. Richard Keeling.

The party made a false start from here several weeks ago when their boat was damaged by ice. This

PROTOTYPE OF LITTLE AMERICA COVERS



A cover from the ill-fated Scott expedition to the antarctie, bearing Victoria Land stamps and special cancellations.

Soviet Party Discovers Two Islands in the Arctic

By The Associated Press.

MOSCOW, Sept. 11.—A wireless message today from the Soviet ice-breaker Sadko reported the discovery of two islands in Arctic waters east of Franz Josef Land.

The ship's position was given as Lat. 81 degrees, 12 minutes N. and Long. 72 degrees, 22 minutes E., which would put it northeast of Northern Island, off the northernmost tip of Siberia. The report said the Sadko was trying to buck an eight-mile ice barrier in order to land a party.

time the Polecat pushed out into Hudson Bay without mishap and was headed toward Rankin Inlet, 300 miles to the north.

The first Winter will be spent at Repulse Bay, 250 miles beyond Rankin Inlet. The following Winter will find the young scientists in the neighborhood of the North Magnetic Pole and the third Winter in northern parts of Baffin Land and Ellesmere Island.

The expedition plans to meet the Canadian Government's supply ship Nasco at Pond's Inlet, 1,000 miles north of Churchill, in the Autumn of 1939 and return to civilization in her.

The Nasco also will carry supplies and equipment to the expedition on its annual trip to the north this Summer and will leave them at Southampton Island.

The young Britons will engage in scientific study and will also map the west coast of Baffin Land.

In their equipment are thousands of aluminum bands for placing on birds in their northern nesting ground with a view of studying their habits of migration.

Mr. Manning and his companions expect to travel about 10,000 miles during their stay in the North.

RUSSIANS DISCOVER 19 ARCTIC ISLANDS

Icebreaker Sedoff, Returning to Archangel, Reports Finds Off Nordensteld Archipelago.

MOSCOW, Oct. 16 (AP).—Soviet explorers reported today that they had discovered nineteen new islands

Admiral Byrd Stamp Prototype of Scott Issue

Probably few present-day collectors are aware that the United States issue of October 9, 1938, marking Admiral Byrd's second Antarctic expedition, had a prototype in the stamps and special envelope markings of the ill-fated Scott expedition more than twenty years earlier.

As shown in the illustration, a cover is known bearing two stamps of Victoria Land; postmarked January 18, 1913, and marked with the special cachet of the ship Terra Nova bearing Capt. Scott and his companions on the trip from which none returned.

near the Nordensteld Archipelago in the north polar region. The discoveries became known when the Russian icebreaker Sedoff returned to Archangel for the Winter with a hydrographic expedition that had made extensive surveys in the ice-clogged seas north of Siberia.

One group of eight islands was named for Professor Otto Schmidt, director of the Leningrad Arctic Institute. Others were named for heroes of the Chelyuskin rescue in 1934, when drivers of sixty dog teams battled a blizzard to reach a party, led by Professor Schmidt, which had been stranded in Bering Strait after its ship, the Chelyuskin, had been crushed by ice.

ARCTIC GROUP RELICS FOUND BY RUSSIANS

Traces of Rusanoff, Lost in 1912, Believed Discovered

MOSCOW, Sept. 26 (AP).—Traces of an Arctic expedition which perished in 1912 were asserted today to have been found in Kara Sea. The Russian hydrographic boat Toros reported to the All-Union Arctic Institute that it had discovered on a remote island in the Kara Sea traces of the lost expedition of V. A. Rusanoff.

The Toros found clothing, cartridges and personal belongings which have been sent to Moscow for identification.

The Toros is trying to reach the island where it is believed Rusanoff's men perished.

11 Soviet Explorers Die in an Arctic Storm; Survivor Is Found in a Boat With Ten Bodies

By The Associated Press.

ARCHANGEL, U. S. S. R., July 5.—Twenty-year-old Ivan Krukhoff related today the story of a grim voyage through the waters of the White Sea with a cargo of ten dead men.

Krukhoff was the lone survivor of a party of twelve, all members of a scientific expedition. He reached safety in a lifeboat loaded with the bodies of ten of the others. The eleventh body was not recovered.

Thousands of persons attended a mass funeral yesterday for the victims.

The twelve, headed by G. Bardino, a hydrographer left the expedition's steamer Toros on June 27 in a small boat to make a study of the depth of the sea between Archangel and Kandalashka Bay, on a route crossing the Arctic Circle.

"After three days' work," said the youth, "we decided to return to the ship. We were caught by a storm. Mountainous waves capsized the boat and swept away the oars, equipment and a comrade, Nikolai Fedoseyeff, whom we never saw again.

"Struggling in the water, the rest of us with great difficulty managed to right the boat and climb in. Then for a day and a night we were the prey of a furious sea. We had no oars; we tried frantically to row with our hands.

"The boat constantly shipped water. We scooped it out with our hands and our caps.

"It was horribly cold. One after another, my companions died of exposure and exhaustion until I was left alone with ten bodies.

"The sea grew rougher and it was only by tying my right wrist to the oarlock that I was able to stick to the boat. The bodies of my companions remained in the bottom of the boat where I had placed them, but I was several times washed overboard, being held fast only by my lashed wrist."

When picked up by the Toros, the boat still held the bodies and the unconscious survivor.

The dead men were buried in one grave. The government will build a monument over it and give 5,000 rubles to the family of each.

2 Soviet Flyers End Trip From U.S. to Moscow

Finish 10,000-Mile Exploration Flight Started on Aug. 5 at Los Angeles

From the Herald Tribune Bureau

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MOSCOW, Sept. 13.—Sigismund Levanevsky and Victor Levchenko, Soviet Union aviators, who left Los Angeles on August 5 on a 10,000-mile aerial exploration flight to Moscow by the northern route, completed the final lap of their journey today and received a heroes' reception from high officials of the U. S. S. R. For their flight, designed to establish a tentative flying route between the Soviet Union and the United States, the flyers used a red-winged American monoplane.

The flyers, who landed at a military airport seventeen miles from Moscow, were welcomed by high officials including Vyacheslav M. Molotov, chairman of the Council of People's Commissars, and Ivan F. Tkachov, chief of the Civil Aviation Department. They had flown today from Sverdlovsk, in the Ural Mountains, about 1,000 miles east of Moscow.

Three military planes had been sent up to escort the aviators, but the escorting ships became lost in heavy clouds and the red-winged plane bearing Levanevsky and Levchenko swooped down on the field almost before the great crowd was aware of it. From the airport the flyers went to Moscow by automobile, receiving the cheers of thousands in the villages through which they passed on the way.

Thousands Line Streets

In Moscow the reception was even warmer. Hundreds of thousands lined the streets to cheer Levanevsky, who has been called the "Lindbergh of Russia," and his co-pilot, and tossed flowers into their automobile.

For their successful flight both flyers received decorations and cash awards. Levanevsky's award was 25,000 rubles (about \$21,700) and Levchenko's was 15,000 rubles (about \$13,000).

In his welcome to the flyers Tkachov said that Soviet aviation was fulfilling its "obvious destiny" in planning a northern route to America and that the project would be continued with vigor. Just as the newspapers had already done, Tkachov emphasized that the flyers' use of a foreign plane had little significance.

"Even advanced American technique," said Tkachov, "took the advice of our men in building the ship."

The flyers' itinerary included San Francisco, Seattle, Juneau, Fairbanks and Nome, Alaska; Whelan Bay, Ichokogsky, Cape Schmidt and other points in Siberia.

Ice Breaker Abandoned

MOSCOW, Dec. 26 (UP).—The Soviet ice breaker Sibiriakov has had to be abandoned in the ice-locked Kara Sea, according to radio advices from the ship today. Four ice breakers sent to the rescue took off the crew but were unable to free the Sibiriakov.

ARCHANGEL, U. S. S. R., Nov. 27 (UP).—The icebreaker Sibiriakov ran on the rocks today near Nova Zembla and reported she was rapidly filling with water. The crew were without fresh water or lights to guide rescue boats which left Archangel to aid them.



5,858-Mile Flight Made By Trio in Soviet Plane

MOSCOW, July 23 (P).—A stiff wind and a threatened gasoline shortage forced two Soviet distance flyers to land near Nicolayevsk, Siberia, after a 5,858-mile non-stop flight from Moscow, it was disclosed today.

The single-motored plane bearing pilots Chekalov and Baidukov, and the navigator Beliakov, passed fifty-six hours and twenty minutes in the air on their flight over the Arctic Circle, and landed at 3:45 p. m. (8:45 a. m., E. S. T.) yesterday on a small island in the Amur River.

On receipt of reports of their plight, the Commissar of Heavy Industry ordered them to land, inasmuch as the purpose of the flight was said to have been accomplished. They originally were scheduled to fly to Chita, or Irkutsk, Siberia.

The trend of Soviet aviation from its beginning has been in the direction of long-range flying. Even before the revolution Russia's designers, led by Igor Sikorsky, concentrated on long-range load-carrying planes.

In recent years Soviet fliers have been using the Arctic as a labora-

tory, believing with Roald Amundsen and other Polar explorers that future world trade routes will be across the top of the world. A few years ago the Russians began to copy, with the help of German engineers, the so-called Junkers design of low-winged all-metal planes with slow-turning, economical engines.

These machines are not fast, but are suited to the great distances of the Soviet Union, carry heavy loads and are rugged. When Wiley Post made his famous round-the-world flight alone he discovered that the Russians were putting in air fields equipped with radio and machine shops across Siberia and almost to the edge of Bering Sea.

MOSCOW, Aug. 10.—A million Muscovites today welcomed home the three aviators whose non-stop Arctic flight of nearly 6,000 miles won them the titles of "Heroes of the Soviet Union," with the fervor that the Soviet knows so well how to show for those it wishes to honor.

PLANES RESCUE 285 IN ARCTIC

MOSCOW, Oct. 2 (AP).—From Taimir Peninsula, the northernmost tip of Continental Russia, came tales of bravery and heroism today.

Three planes shuttled swiftly back and forth from the mouth of the Pyasina River, taking 285 men off 40 ships caught by the Winter ice and unable to put to sea. The men were being flown 300 miles south, to the Arctic supply base at Krasnoyarsk, on Trans-Siberian planes. Skeleton crews will be left aboard the vessels until Spring.

Moscow Aviator Traces All the Soviet Coastline

Molokov Acclaimed on Return From 2-Month Arctic Trip

MOSCOW, Sept. 20 (P).—Russia's aviator hero, V. S. Molokov, was acclaimed today on his return from a two-month aerial exploration of the Arctic across the northern coast of Siberia. Molokov, on a flight of more than 15,625 miles, was the first to trace the entire length of the tortuous Soviet coastline.

He started from Krasnoyarsk, southern supply base for Arctic aviators, and flew his hydroplane all the way to Wrangel Island, rimming the Arctic Ocean virtually from Barents Sea to the Bering Sea. He touched at Yakutsk, Kamchatka, Wellen and Wrangel Island on the outward flight. He returned by easy stages to Archangel and Moscow.

The flight accentuated the careful survey work the Soviet has undertaken in the Arctic in preparation for regular polar air service to the Far East and the United States.

Molokov in 1934 received the Order of Lenin and the title of "hero of the Soviet Union," as well as a year's pay, for his rescue of sixty-two men by airplane from an Arctic ice floe. He made nine trips to remove a stranded expedition from its perilous plight.

Officials are hopeful the Rusanoff will be able to free herself, but if the effort fails the men are believed to be in no immediate danger. The ship carries supplies for six months and authorities believe they would be able to walk across the ice to Tikhaya Bay, if the freeze-over is hard enough.

MOSCOW, Sept. 21 (AP).—The Russian icebreaker Rusanoff broke free tonight of the ice jam that had held her prisoner for two weeks and floated in open water.

Officials in Moscow were advised of the little vessel's successful fight against the floes by a radio message from the icebreaker Sadko, which had gone to the Rusanoff's aid.

Russians Quit Polar Expedition

MOSCOW, Aug. 28 (AP).—Professor R. L. Samoilovich radioed today from his icebreaker Sadko that he was forced by ice-barriers to abandon the search for the mysterious Sannikoff Land in the North Pole region. The expedition of Soviet explorers and scientists which left Archangel July 22, is en route to Spitzbergen, Greenland, Professor Samoilovich said, where other scientific work will be undertaken.

Ice Traps Russian Vessel in the Arctic As It Is Landing a Scientific Expedition

By The Associated Press.

MOSCOW, Sept. 20.—The struggle of a handful of men against the Arctic Winter was written here tonight in radio messages from the region of the North Pole.

The Russian icebreaker Rusanoff was trapped off Randolph Island on Sept. 9 by shifting ice while scientists and members of its crew were trudging across an ice floe carrying supplies for the establishment of the northernmost Winter camp in the world.

The heroic decision to risk seeing their vessel crushed like an eggshell under them rather than abandon the men on shore, left the expedition members tonight working desperately to free the sturdy 1,750-ton craft.

They believe they have less than a week in which to free the ship before the fast-coming Winter locks them behind walls of ice.

The icebreaker Sadko, carrying another expedition of Soviet scientists, rushed to the rescue of the Rusanoff, but was unable to approach it through the ice field. The Rusanoff is more than half a mile from open water and the Sadko would face the same fate as that of the Rusanoff if it attempted to penetrate the ice.

The crew of sixty-five men and the seventeen explorers who planned to camp for the Winter on Randolph Island are fighting with steam and dynamite to blast a path to open water or shake the Rusanoff free from its icy shackles.

Soviet Experiments in Construction on Frozen Soil

By WALDEMAR KAEMPFERT

NEARLY half the Soviet Union is frozen even in Summer. There are gold and other metals in these icy regions. Also industrial possibilities. So it became part of a planned economy to study frozen earth and learn how to exploit it.

The story of men who have lived for months on blizzard-swept wastes and who have pushed on through ice floes to map territory that was only vaguely known has been told in snatches both in motion-picture films and in press dispatches. A more intimate glimpse of the scientific work that has been done is given in *Vestnik Akademii Nauk, U. S. S. R.* (Bulletin of the Academy of Sciences, U. S. S. R.).

Five years ago a committee to study the permanently frozen regions, as they are called, was appointed by the Soviet Academy of Sciences. Its first task was to make an accurate map of the frozen north.

It is a colossus of a map. The aggregate length of its separate

drawings is two-thirds of a mile. For the first time the shape of the frozen territory is known. Not only that, but the temperatures, too, of the soil. A glance is enough to tell an engineer what conditions he must overcome in a given spot. In many a place the thermometer never rises above 5 degrees C. at a depth of forty-five feet. The ground on which the city of Yakutsk stands has not thawed in the last 5,000 years.

Borings made by V. M. Ponomarev show that near Spitzbergen the permanently frozen crust is 650 feet deep. On Vaigach it is only 328 feet. Moreover, the subterranean temperature of that island rises so rapidly that mining shafts have been sunk deeper than the surrounding sea.

The Commission of the Academy claims that thorough engineering studies have been made of dry and wet soils over a range of temperatures never before considered. It turns out that the water capacity of a soil varies with the temperature. There may be so much water

that a thaw will convert frozen soil into mud or even a floating island. A well-informed Soviet engineer would never sink foundations to forty or more feet when the temperature is not more than a degree or so below the freezing point.

Fortunately, the Soviet scientists were able to draw on the work that has been done in Germany, Austria, Sweden, France and the United States in what is called "soil mechanics."

Slides that attended the digging of the Panama Canal, failures of dams, the settling of huge public buildings drove home to civil engineers the instability of the earth. Long before the Czar was dethroned it was known that more was necessary than to drill a hole in frozen ground, bring up random samples of soil and test these in a laboratory to decide what kind of a foundation to build. And this because the soil is never uniform.

A quarter of a century of systematic research convinced engineers that they must have more than a perfunctory knowledge of geology and that they must rely on not a few but on many samples if they are to build adequate foundations. Moreover, the samples must be taken from great depths and tested under stresses that would probably prevail at a given depth under a projected structure. An immense amount of research thus conducted has given us the science of soil machines. Now engineers are able to forecast how foundations must be designed if the superposed structure is not to collapse.

'Land of High Mountains' Sought by Soviet Party

Arctic Region, Discovered in 1810, Never Found Again

ARCHANGEL, U. S. S. R., July 24 (P).—The Soviet ice breaker *Sadko* sailed today for the Arctic in search of a mysterious "land of high mountains" not seen since 1810. The party aboard the ice breaker comprises the most elaborate scientific expedition ever projected into the North by the Soviet Union. It is prepared to stay two or three years if necessary, although a three-month journey is planned.

The land sought was sighted for the first and last time 126 years ago by the Siberian trader Sannikov. Two explorers have sought it since. The ice breaker carries a laboratory, aviators, deep-sea divers and scientists of many branches for a far-reaching study of the North.

At the head of the expedition of 83 explorers will be Prof. R. L. Samoilovich, director of the All-Union Arctic Institute. The party includes Prof. Samoilovich's 16-year-old son

Sannikoff Land is believed to lie north of the new Siberias in 78 to 80 degrees north latitude and 140 to 150 degrees east longitude.

It was described by the trader Sannikoff as "a land of high mountains" in his diary.

"It was only 20 versts (13 1/4 miles) away," he wrote, "but could not be approached. An unfrozen patch of water under a thin layer of ice which extended on all sides kept me from reaching its shores."

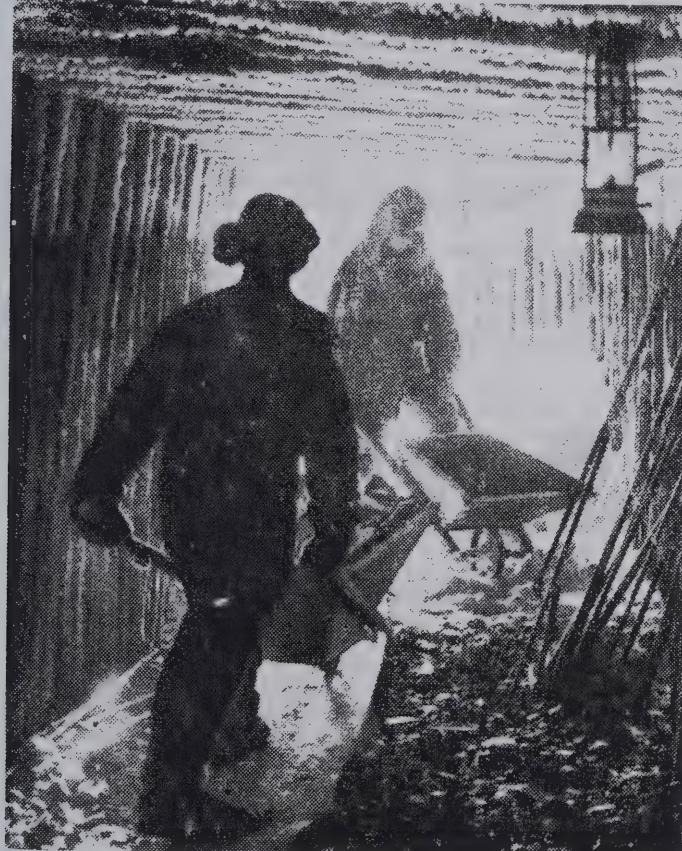
In 1811 the island appeared on maps, although its location had not been determined. Fridtjof Hansen, Norwegian explorer, reported in 1893 he had visited the supposed locality of the unknown territory. Many birds, indicating presence of land, hovered over his ship, he said.

An expedition sent out in 1900 to search for the land ended in disaster, several of its members perishing on the ice.

Seek Secret of Unfreezable Sea

MOSCOW (P).—Seeking the reason why Victoria Sea in the far north does not freeze over even in bitterest Winter, the Soviet Government this year will set up the northernmost Winter camp in the world.

This station will be established by the administration of the northern sea route on Rudolph Island in Franz Josef Land, only a few hundred miles from the North Pole. Seventeen persons who will Winter at this outpost now are preparing the expedition in Leningrad.



Sovfoto.

Mining coal in the permanently frozen north of European Russia. The timbered gallery is covered with frost and stalactites. The mine could not have been developed had it not been for the work of the Soviet Academy in studying the permanently frozen regions and determining how soils behave when they freeze and thaw. An example of the Academy's method of research is shown at the right: a Soviet hydrologist is taking the temperature of the soil. It was discovered that in some places the ground had not thawed in 5,000 years.



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SOME ASPECTS OF THE POLAR REGIONS

By Professor F. DEBENHAM, O.B.E.

[Presidential Address to Section E—Geography, at the Norwich Meeting of the British Association for the Advancement of Science, 1935.]

We are accustomed to the saying that the world is becoming smaller every year, yet it is still the privilege of very few to visit personally all its major regions. We do say, and say wisely, that it is the duty of geographers, if possible, to visit the lands of which they read and write; but we know all the time that this is a counsel of perfection so rarely attained that it may almost be left out of practical consideration. We are, in fact, in the mass, still immobile on this world of ours, and we still have to take our impressions of regions other than our own from picture and narrative. Nevertheless, with so many travellers apt at descriptive writing, with such a world-wide Press, and, perhaps even more vitally, with so much broadcasting, we can, if we care to try, summon a very clear picture of the main natural regions of the world. It is not, for instance, difficult for the normal reader to imagine the green hell of the Amazonian forest, the parched solitudes of the great desert belts, or the towering magnificence of the Himalayas.

Each of us, according to the extent of our reading and the vigour of our imagination, has a mental picture of these major regions, and no doubt all of you have a fairly vivid picture of the polar regions in your minds. What is not so easy to come by, however, is an appreciation of that picture in terms of its value to mankind. I propose, therefore, to guide your faculty for correlation by briefly sketching, not the polar regions themselves, of which you already have an idea, but the influence those regions may have, and perhaps should have, on both the material and the ethical progress of mankind.

There is now a vast literature of the polar regions, both north and south, but the proportion of those books and papers which deal with the subject on a broad basis is very small, and is certainly not easily accessible. In many of these books we are invited to conjure up the sensations of the polar explorer, to feel his frost-bites, to savour his pemmican, to glory in his pack-ice and his glaciers, even to die his death. Not the least part of our interest in polar work is due to these invitations so graphically offered to us in text and illustration.

Much more rare is it to find a polar explorer viewing his territory as a whole, and trying to fit it into the scheme of the world in general. In a word, we are rather encouraged to regard the polar regions as places apart, extraneous to the real comity of the world.

It is perhaps a natural but nevertheless a lamentable fact that immediately one speaks of values, the listener interprets it in pounds, shillings and pence, and indeed many will never get farther than that, and can hardly conceive of a value that cannot be stated in the terms of the economist. We will therefore first consider the kind of value in the polar regions which appeals most quickly to the public.

There is little need to sketch the history of man's attempts to achieve economic gain from the polar regions. From the days when Martin Frobisher attempted to find a quick route westwards to the Spice Islands *via* the North-West, and Barents a similar route eastward, down to more recent times when, though the routes had lost value, the products of hunting, fishing and mining attracted venturers with similar motives, the chief aim of promoters of polar expeditions has been one of ultimate gain. It is true that many of the leaders of the expeditions had little care for the commercial side, but the money that sent them forth was, in the greater number of cases, put out in the time-honoured hope of all ages that it would bring in interest in some form or another.

There is certainly such a thing as the romance of commerce in the North, for most of its industries have something peculiar and unusual about them. We may instance the cryolite mines of Ivigtut in Greenland—a strange mineral found in quantity nowhere else in the world, which however is almost essential to the large-scale production of aluminium. Again, until recently a large proportion of the ivory for use in northern China did not come from the present-day elephants of the rain forest belt of Asia, but from the mammoths of primeval times whose tusks lay for many thousands of years buried in the mud of the great Siberian rivers which flow into the Arctic Ocean.

Romantic or not, the story of Arctic trade has a grim and melancholy side, in that several of its most promising ventures have died a slow and painful death by reason of the cupidity of man and his unwillingness to co-operate either to preserve life or even to preserve it sufficiently for his own benefit. The history of the whaling

industry in the Arctic is an instance of this incapacity of man to co-operate in taking the most common-sense measures to cherish a valuable industry. There is every reason to hope that the day of non-co-operation has passed and that whaling in the Antarctic will not suffer a similar fate, for it is probably common knowledge that many bodies, in which we may include the League of Nations, the Norwegian whalers themselves and the Discovery Committee of the British Government, are at work in their various spheres to prevent any extermination of the southern whales, and at the same time to regularise an industry which, even in these days of synthetic materials, still has its vital uses to man. How large that industry now is, may be gathered from the fact that the annual catch of whales in the southern seas is about 20,000: how mindful it now is of its own future may be seen from the fact that whereas the average whale used to provide only 60 or 70 barrels of oil, it is now made to yield nearly 120 barrels of oil besides other products.

The fur trade in the Arctic has never suffered quite such staggering blows as the whaling industry, yet it is not so very many years since nothing less than international complications were a strong enough threat to ensure that the fur-bearing seals should not be exterminated as a species. That is precisely what did happen in the Antarctic in the early years of last century, when in less than a decade all but a few hundred of this kind of seal were slaughtered.

These products of hunting, fishing and mining were the natural resources of the North and were the first to be exploited, but quite recently a new factor in the commercial aspect of the North has come to the forefront. With the progress of long-distance aviation and the simple application of the principle of great-circle navigation, the idea of using these northern latitudes for passenger and even freight routes in the air has become not only prominent but almost insistent.

Owing to the misleading projections on which most of our maps are constructed, it is not usually recognised that the most direct route between, say, Berlin and Montreal, or Glasgow and Winnipeg, is over Greenland, but it is so. It seems to be only a matter of time and the inevitable improvement of aeroplanes, before some use is made of a route, the conditions of which were first investigated by the Watkins Expedition of 1930.

All these economic aspects of the polar regions necessarily have a political bearing. Though it was not until the present century that the great Powers began to take a close interest in the idea of possessing polar territories, there has been in recent years a degree of keenness in this respect which is not dissimilar to that which prompted the partition of Africa in the latter part of last century. In the eyes of the historian of the future it is probable that the more or less forcible partition of Africa will be regarded with condemnation, since in that case there were peoples whose rights had to be ignored, and a degree of envy and jealousy between participating nations which was far from being creditable. In the polar regions the case is different, in that those lands which had a native population were taken under protection at an early date by Russia, the United States, Canada, and Denmark. Though there has been, since the Great War, a rush for the remaining unclaimed land areas of the North, this was carried out with a reasonable lack of animosity between the nations concerned. In the North there are now no tracts of land which are not either settled in part or specifically claimed by one of the Powers. The recent adjudication of rights over East Greenland by the International Court at The Hague in favour of Denmark has settled what might have been a standing cause for bickering.

In the Antarctic regions, which are far less known than the Arctic, the political aspect has come forward of recent years almost entirely on account of the whaling industry which, though now largely carried out at sea, had at first to depend upon land stations for its full operation. It cannot be said, even by the British nation, which claims the greater part of the Antarctic continent, that the matter is settled as yet in a satisfactory way. It seems that none of the usual precedents of international law can be made to apply to the land mass of Antarctica, for not only is occupation, in the proper sense of the word, more or less impossible, but not even the most sanguine company-promoter could say that the land, as such, has a value. The wealth of the Antarctic to man lies in the seas around it, which are free to all, and such claims as there have been for land sectors, have been based variously on the protection of whales, the pursuit of whaling, the juxtaposition of civilised land and possibly, but not certainly, the assertion of land claims merely as a gesture. Naturally these claims are apt to be inconsistent.

It is difficult, if not dangerous, for the layman to step in where only the diplomat is accustomed to tread, but one is forced to wonder whether the various Foreign Offices concerned in claims to territory in the Antarctic have been fully and wisely informed as to the real value of some of the zones or sectors which have been the

subject of negotiation in recent years. A claim to land which is almost entirely covered by ice, which has no harbours and can rarely even be approached by a ship, is surely a shadowy if not a useless one, and invites the suspicion that an unworthy spirit lies behind the claim.

None of the nations concerned is quite free from blame in this respect, neither is there reference to any particular nation.

It is probably too late for any alternative arrangement to be adopted, but had there been a League of Nations in existence at the beginning of this century, before any claims had been laid in the Antarctic, the protection and administration of this last and least useful continent would have been a most appropriate subject for League administration. It can never be inhabited by man in the proper sense of the word, but it might serve as an "international park" of vast proportions which should be open to all nations who would respect its amenities.

Political might-have-beens, however, are no more useful than economic ones, and claims to territory, which can do little beyond giving a large splash of colour on the map, are bound to continue.

One point, however, must be made clear as a matter of common justice to possible claimants, and that is, that territory claimed should at least be investigated, and we can well imagine that it is for the purpose of carrying out this obvious duty that the British Government has felt kindly towards recent Antarctic exploration by its nationals.

Summing up this economic aspect of the polar regions, the warning may be given that even now, as in the past, there is a tendency to ascribe potential wealth merely on account of the existence of land masses. Indeed, even explorers, who should have known better, have been heard to speak glibly of the untapped mineral resources of the polar lands, neglecting to tell their public that though these resources undoubtedly exist, they are for the most part covered by thick ice sheets or rendered inaccessible by topography, or climate, or both. Quite a brief calculation, for instance, would show that the proportion of the Antarctic continent available to the prospector and miner, is to the total land mass in somewhat the same proportion as the area of the city of Norwich is to the whole of England.

Although the land can have little value in the Antarctic there is, strangely enough, a natural resource in the air which, however fantastic it may appear to us, may yet have a substantial interest for our descendants. It is a truism of science that we draw practically all our sources of power from the sun, either indirectly in the form of coal and oil, or directly in the form of water power, in which the sun by evaporation has raised water to a height from which gravity, suitably used, returns power to us. Now, although water is one of the great scarcities of the polar regions, and the movement of ice masses can hardly be handled by engineers, yet meteorological processes are doing the same thing for air, raising masses of air in one area which sink down in another, and so provide a source of power less tangible but just as real as that of water in a highland lake. The persistence, the strength and the frequency of the Antarctic blizzards compels anyone who has experienced them to feel that here is a vast source of power as yet untapped. May we be permitted to forecast that some day the miseries of the storm-bound parties of Mawson's expedition, when for a whole year the wind averaged gale force, may be atoned for by our descendants making use of this power when coal is scarce and oil exhausted, and when all the water power in the temperate regions is fully harnessed?

It would be unwise and inappropriate to burden a presidential address with statistics of wind in the Antarctic, but I do invite you to compare in your mind the power in the well-known falls of Niagara, about 6000 tons of water falling per second, with the power in the little-known Adelie Land, where an air river of at least 50 miles in width and probably some hundreds of feet in depth is moving outwards from the plateau at an average velocity of 50 miles per hour or about 70 feet per second for most of the year.

I will not further anticipate some H. G. Wells of the future who will ring the Antarctic with windmills producing power to be sent by wireless to the southern hemisphere, but merely assure my audience that the winds of the Antarctic have to be felt to be believed, and that nothing is quite impossible to physicists and engineers.

We will not refer in detail here to the well-known efforts of the Canadians, guided by the enthusiasm of Mr. Stefansson, towards increasing the pastoral value of the Canadian Arctic by the introduction and preservation of reindeer and other animals. This enterprise must go on; but in spite of Mr. Stefansson's arguments, one is forced to believe that if we limit these efforts to the truly Arctic lands, the net effect on the world production of meat will be slight.

We pass now from the economic aspect of our subject to some others which have less appeal to the man in the street, but which

must never be omitted in any consideration of a region by a geographer.

If we ask ourselves why so many people have gone to the polar regions in the past for other than economic reasons, the answer is perfectly plain. To say they have gone because they wanted to is too bald a way of putting the answer. Their reason for going is that the polar regions have offered them something which they cannot get elsewhere. One of these things is solitude, relief from the company of too many of their fellow-men. One must be careful in dealing with such an abstract part of the subject to define that love of solitude or, as the journalist would call it, "the lure of the wide, open spaces." To begin with, it affects only a very small proportion of men and, I venture to suggest, very few women. It also is usually of a temporary nature, and the man who considers himself most content in the heart of the Sahara, or on the plateau of Greenland, is very often so content because he knows that at the end of a certain term of residence in such a place he has Paris or Piccadilly to return to for contrast. When he does return, however, he is likely to be bothered and fussed with the apparently seething mass of his fellow-creatures, to be hustled out of his contentment by a world of telephones and postmen and the daily press, and to consider very quickly that the lives and aims of men in the mass are sordid and small compared to the simple life of the lands from whence he has returned. We may smile at these psychological effects, and we may consider that the explorer type, who is restless in civilisation, is a person apart, to be given his way but not to be pampered.

On the other hand, we must not forget that not only are holidays necessary to man, but that, with increasing rapidity and ease of transport, the holidays of civilised peoples will tend to be taken farther afield. Even before the War there were such things as pleasure cruises to the North; but what is just as feasible, and has not yet come, is the extension of these cruises into summer holidays on land in the Arctic. Nor is it too wild a forecast to say that in time to come there may be a Brighton of Spitsbergen, a resurrection, in fact, of the Smeerenberg of two centuries ago, when each summer a large township established itself on this island for the whaling. The township will be a city of rest and holiday instead of a city of greasiness and blubber; but the means of establishing such a centre come closer to hand with every new invention.

It is true that the Antarctic can never be considered a playground for the southern hemisphere, except for those who are willing to undergo an uncomfortable, if not a risky, sea voyage or a rather long aerial journey. It is true also that in the North, under present circumstances, the amount of territory available for holiday purposes is practically confined to Spitsbergen, now known as Svalbard. The accessible parts of Greenland, for instance, belong to the Greenlanders under the careful guardianship of Denmark, and must not be looked upon as a holiday resort. The Franz Josef Archipelago is not always accessible, and the more distant Novaya Zemlya, as well as the Canadian Arctic islands, will be for a long time to come too far from the main centres of population in Europe and America.

This consideration of the polar regions as a holiday resort for the citizens of crowded lands, leads us naturally to mention a far greater value which has as yet hardly been considered by civilisation, a value which indeed may yet prove to be more worthy of study than all those we have so far mentioned. It is reasonable to suppose that when some far-travelled medical man comes to write a book on the geography of diseases we shall be able to come by a clear idea of the places where health is best to be sought. The ordinary geographer would, however, even now be able to make something of an essay on the distribution of healthiness over the world. Leaving out cities as unnatural, or at least unhealthy aggregations of humans, he would at once say that on the whole the most unhealthy parts of the world were in the Tropics, though he would have to have a special category for tropical and oceanic islands, which as a rule are decidedly healthy. He would, if he were wise, consider that the Steppe deserts were healthy zones; but probably he would decide that the temperate zone as a whole, provided it is not too far from the sea, is the healthiest belt of the world for man. It is almost certain that he would entirely forget that the polar regions are the most healthy segments of the earth's surface, in the sense that the ordinary disease-bearers, whether they be rodents or insects or minute bacilli, find the conditions either impossible for existence or inhibitive.

But we are not concerned here so much with the healthiness of the zone as with its value from a remedial point of view, for we are certainly not going to migrate in millions to the Arctic just because we cannot there contract the diseases of our own lands. But what we may well consider is the corollary to that healthiness, namely, that many, though not all, of the diseases contracted in temperate climates can be cured by residence in the polar regions.

I am aware that it is more than dangerous, indeed provocative

in the highest degree, for anyone outside the medical faculty to say how far special diseases are curable by residence in a pure air and a cold one. It seems, however, from the experience of sanatoria in the Alps, etc., that it is the sufferers from pulmonary diseases who are most likely to get benefit from such residence. The question will at once be asked as to what the polar regions can supply which is not already obtainable, say, in the Alps. For an answer to this question we must look to the doctors; but it does seem likely that residence in a vast territory free from germs or the conditions for their transport must, *prima facie*, be better than residence in an alpine region which is surrounded by, and is merely above, zones teeming with possibilities of disease. If this thesis is correct, and it is one which a small period of research could easily confirm or refute, then surely we are neglecting an aspect of the polar regions which is of major importance to mankind, more valuable than all the industries they will ever support.

If it be true, as I believe, that the greatest gifts of science to mankind lie in the realms of preventive and remedial medicine, then surely here is an investigation which should not be left as merely a pious hope in a presidential address, but deserves promulgation and action.

To test the value of the suggestion there is needed some research and experiment, most appropriately to be carried out under the auspices of one of those international bodies such as the Rockefeller Foundation, which has already done so much for remedial medicine. For assistance in carrying out this research there is needed also the sympathy of governments, especially that of Norway, in whose care is Svalbard or Spitsbergen, the most promising territory in the Arctic for that purpose.

Let us remember, too, before we allow hands of horror to be raised at the expense of such research, that in the past, sums of money have been spent in Spitsbergen for the erection of an airship hangar and provision of the airship itself for a few hours' flight to the Pole, which would be sufficient to erect a hospital and run it for many years in an experiment which might be of permanent value to the world. We must be properly cautious as to results, but at the same time let us preserve our sense of proportion in the value to man of the objects on which money is spent in the polar regions. It is almost lamentable to consider the sums of money which have been spent in what you will all understand by the term of "stunt expeditions" and place those sums in contrast to the difficulty in raising money for such an object as this.

I am aware that in thus inviting consideration of the possibility of establishing sanatoria in the polar regions I shall be incurring the displeasure of explorers, both of the past and of the present; but my answer to such would be that the end is worthy of the means, and that just as an alpine hotel, full of youth and health, can now be found one hundred yards from a sanatorium filled with the ailing, there is room in the polar regions both for sanatoria and for expeditions.

We may now turn to yet another aspect of the polar regions, and one which possibly has a more direct appeal to this Association of scientists than those which have so far occupied our attention, namely, the value to the scientist, both pure and applied, of the phenomena which are peculiar to these regions—phenomena whose existence is well known but whose study is still in its early stages.

No doubt each science will claim the chief value of these phenomena for itself, but it is without any particular bias to one or the other that I should venture to place in the first rank the subject of meteorology as likely in the future to gain most by a prolonged and more intensive study in high latitudes.

We have spoken of the more or less permanent blizzards on parts of the Antarctic continent, and we ourselves live under the intermittent threat of depressions over Iceland. We can therefore, without much imagination, see that even if our weather is not actually manufactured at the polar ends of the world, it is profoundly affected by them. Meteorologists themselves have long been aware of this, and in two successive onslaughts, namely, in 1882 and in 1932, a determined effort was made to collect data simultaneously and widely within the precincts of the Arctic. The conclusions which have been drawn from these results are, as yet, hardly in full circulation, but you will meet few meteorologists who do not sigh for more and more data from the polar regions.

The phenomena of magnetism and aurora, which are somewhat akin to those of meteorology in that they occur in the atmosphere, are also best studied in high latitudes, where, too, the most promising investigations of the ionosphere seem likely to take place.

When we come to the more earthly sciences, the immediate value to mankind is perhaps less evident. In the science of geology, for instance, especially in the branch of tectonics, we cannot afford to

do without close investigation of two segments of the earth comprising together nearly one-tenth of the surface of the globe, and indeed the structure of the earth must become the more interesting, the nearer one gets to its axis of rotation. The geologist has a hard task in lands where the rocks are usually buried beneath ice-caps, and has to be more than usually ready with the inspired guess than in other parts of the world.

In the Antarctic in particular, the highest of all continents and the most closely hidden, there are obviously to be found keys to some of the major problems of earth structure. We may instance only one which, no doubt, is occupying the attention of the geologists of the British Graham Land Expedition at the present moment, an expedition which hopes to press far to the south of the Archipelago where they are now wintering, and to determine why and where the folded ranges of South America and Graham Land merge into, or butt against the faulted escarpments of the Australian sector of the Antarctic.

It is in these larger problems of geology that the polar geologist can give most assistance to science. It is not long since the American papers were full of the discovery of coal beds by Admiral Byrd's geologist within 300 miles of the South Pole, and it was interesting to see that this discovery, which however was originally made by the Shackleton party in 1908, moved the press public to exclamations of wonder that such things could be. This popular amazement is merely an expression of the scientific truism that the Poles were once warmer than they are now. The most fruitful evidence for and against the theories of shifting poles and drifting continents is likely to be found by means of observations near the axis of the earth, rather than in temperate zones.

There has recently been published a fresh determination of the position of Sabine Island on the coast of north-east Greenland which tends to show that there is a definite westerly drift of some metres per year. Similar observations of Jan Mayen are even more startling. For these and other reasons, therefore, the geo-physicist, whom we may call the mathematical cousin of the geologist, must keep his attention on the polar lands.

In the biological sciences, also, there are major problems to which the data of high latitudes alone can give the key, such as the drift of oceanic waters and the movements of plankton and their associated salts. The biologists, however, are already active in these investigations and need no spur to action. The many-sided character of the work of the Discovery Committee in this branch, over all the waters of the Antarctic ocean, is evidence of the care with which work on this aspect of the polar regions is being carried out.

Lastly, I would ask your permission to consider yet another aspect of the polar regions, one which is perhaps more psychological than geographical, namely, their value as an outlet to that spirit of adventure and urge for exploration which has always been an attribute of man, and which will not diminish however small the world may grow. It is a spirit which is at work equally in the small child climbing the apple tree, the schoolboy exploring his own small horizon, the undergraduate forming alpine clubs to scale the peaks of his own college, and the city clerk spending his week-ends living dangerously in sailing dinghy or on motor bicycle.

In all of these there is a curious combination of an urge to test one's abilities and yet a desire for a secondary and more useful object in the deed itself, and this dual purpose is particularly evident in most of the young men who come to the Scott Polar Research Institute in Cambridge seeking ways in which to visit the Arctic.

Looking over the files of the geographical journals of the past few years, it is possible to see how many young men turn annually to the Arctic to satisfy their need for an outlet. If we include the official expeditions of governments such as that of the Soviet, we shall find that every summer more than fifty groups of investigators go to the Arctic and, were it less expensive, the number would easily be trebled. Only a few of these groups go for purely scientific work, and still fewer for hunting alone. They are, in fact, as a rule imbued chiefly with a desire to see strange places and endure strange things, and only in a secondary way to bring back useful results. There has been of recent years a happy tendency for these groups to go and come back without undue fuss and publicity. I would suggest that this use of the Arctic as an outlet to a healthy and laudable desire is one which should not be left out of any assessment of values, even though it must necessarily apply only to a small number of people.

These suggestions as to aspects of interest in high latitudes will, no doubt, appeal to some and bore others, but, in conclusion, I would beg of you, as geographers, not to ignore these uninhabited zones, and I would like to repeat the words of a recent booklet on the subject, that whether it likes it or not, the world must take an interest in the polar regions.

